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Telephony

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AUGUST 19, 1950

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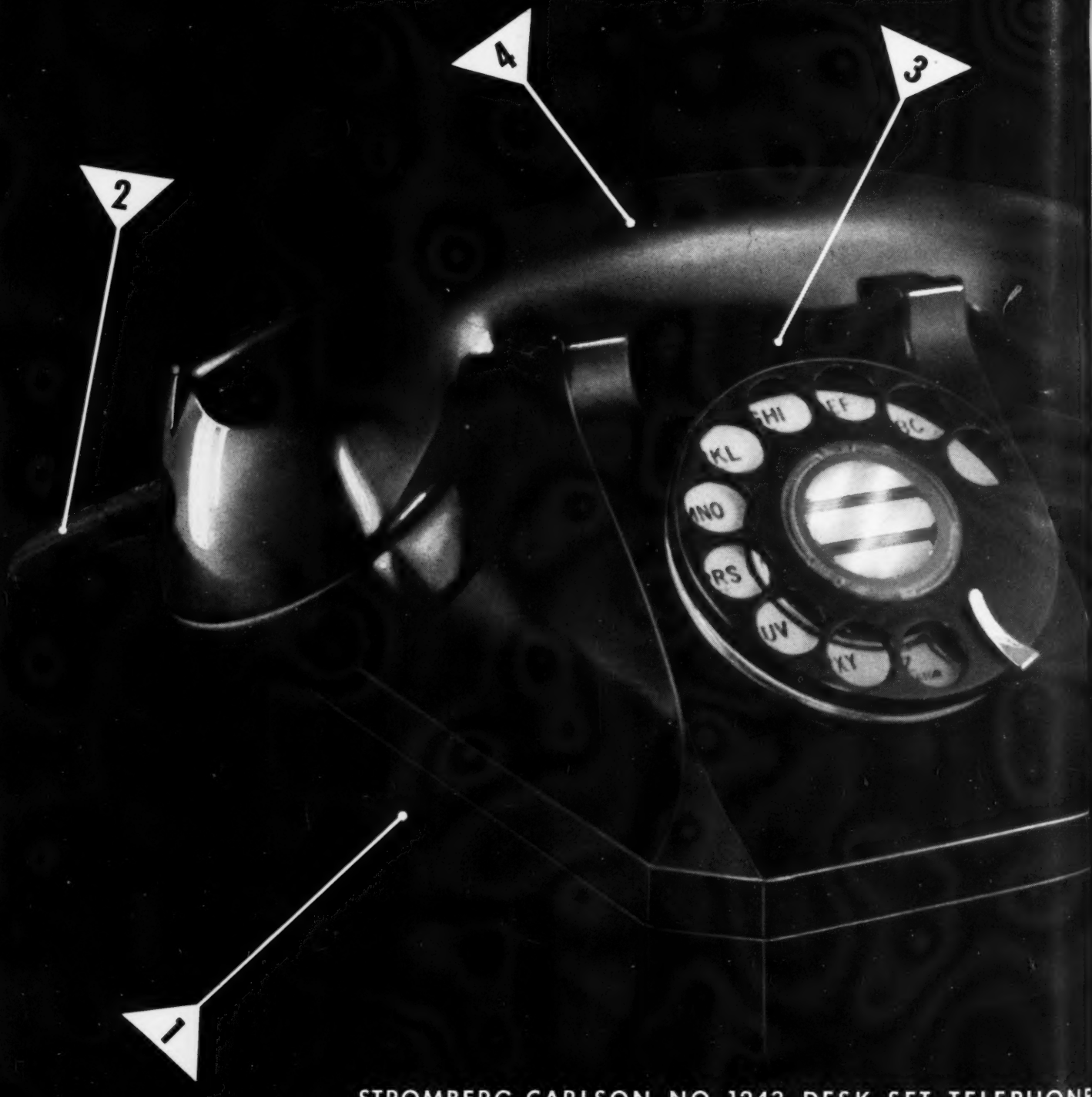
No "Gimmicks" o



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EVERYTHING IN TELEPHONE EQUIPMENT

FLASHES AND PLUGS

ALL FIRE LOOKS RED. Hundreds of telephone calls jammed the switchboard at police headquarters in Jamaica, Queens County, N. Y., one night recently as excited residents called to ask: "Are the Russians coming?"

"The skies are ablaze," the caller said. "The sound of gunfire is deafening."

Police explained it wasn't the Russians or gunfire. It was fireworks at a church bazaar.

• • •

NUDITY SANCTIONED. A woman telephoned police in Raleigh, N. C., that an almost unclothed man was in the neighborhood.

Policemen sped to the scene, but returned without making an arrest. They explained:

"This man walked into a wasps' nest. Had to disrobe."

• • •

SUSPENDED GOSPEL. The Rev. Hugh Hamilton of Eastbourne, Eng., wears a microphone fixed invisibly to his suspenders when he preaches. The microphone is concealed under the vicar's shirt sleeves. Six loudspeakers carry his voice through the 80-foot-high church.

• • •

SOMETHING FOR SMALL FRY. A homemade telephone that has many possibilities for young experimenters was described in the *Milwaukee Journal* recently.

Suggestions for the operation of this device are: Tie a button to each end of the string after passing it through a small hole in the bottom of two clean tin cans. The button prevents the string from pulling through the hole. Stretch the string tightly while one person listens and the other person talks. The voice vibrations will carry along the string of your private telephone. If the 50 ft. of string do not touch any object, the conversation should carry from house to house or yard to yard.

• • •

"BLUE FOR A BOY." A wrong telephone call to a doctor's office proved embarrassing to a Milwaukee, Wis., woman recently, although the doctor's receptionist tried to be helpful.

The caller had requested a radio station to play her favorite song, "Blue for a Boy." As time passed, she wanted to know when she would hear it. So she dialed the number, but got the doctor's office instead and asked, "When do I get my 'Blue for a Boy'?"

"Well, let's see," she was told. I'll get your chart and look up the date. What's your name?"

• • •

UNWILLING DRAFT BOARD. A Springfield, Ohio, couple led a rather quiet life until the Korean war began.

Then the telephone rang constantly. The callers gave statistics on marriages and births and asked puzzling questions about the manpower status.

The reason?

The couple discovered that their telephone number formerly was that of one of the county selective service boards.

Although they were given the vacated number after the board discontinued its telephone, the old board number had appeared in the new telephone directory.

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH
WASHINGTON EDITOR

New Jersey Supreme Court's ruling that transit company's expenses cannot be accepted as part of rate base unless affirmatively approved is reviewed. . . . Decision is of interest to telephone companies. . . . Maryland court differs. Senate begins Bell-Labor hearings.

A "Scotch Verdict" on the Rate Case Front

WITH all the trouble in Korea, and difficulties with inflation at home, the illustrious Supreme Court of New Jersey picked an odd moment to complicate utility rate case procedure. But it has certainly done so along lines which could prove almost as dilatory as some of the speeches being made at the United Nations sessions. The reference to the recent Public Service Coordinated Transport Case, in which the Jersey court threw out a decision of the New Jersey Department of Public Utilities granting an increase in transit fares from five to seven cents.

Although this increase seems modest enough, the reasoning of the court, in reversing the state commission, strongly resembles what the old-school lawyers used to call a "Scotch Verdict." That name comes from an alleged custom of Scotch jurors, in olden days, whenever a suspected rascal had to be set at liberty because the prosecution did not have enough evidence. Instead of returning a verdict of "acquittal," the canny Scotsmen used to return a rather equivocal verdict of "not proven guilty."

Such seems to be about the point of a recent decision handed down by the New Jersey Supreme Court which could raise quite a bit of mischief if it were followed elsewhere. The court did not say that the transit company was not entitled to a rate increase. It merely held that the company had not sustained a very strict "burden of proof" to support its claim that the nickel fare was confiscatory. Telephone companies have a stake in this. Telephone companies, with the possible exception of the transit companies, are somewhat more sensitive to the requirements for increased rates, to cope with inflationary trends, than other public utilities, such as the gas and electric industries.

In a word, the New Jersey opinion, written by Chief Justice Arthur T. Vanderbilt (former dean of the New York University School of Law) takes the view that the expenditures of a utility, as shown by its books, cannot be accepted as part of the rate base or operating expenses *unless affirmatively proved*. This is a startling departure from accepted regulatory doctrine.

Already the New Jersey commission has rejected two other rate increases on the strength of this decision, and other state commissions (reluctant to allow rate increases anyway) may be tempted to follow suit. The New Jersey commission, last week, suspended (until Nov. 21) further hearings on New Jersey Bell Telephone Co.'s request of an increase of $9,800,000 in intrastate rates.

Offhand, it would seem that a nickel fare, in this day of high prices, is about as obsolete as a five-cent glass of beer, or the late Vice President Marshall's "good five-cent cigar." But it is the refusal of the Jersey court to take a realistic view of the merits and necessities of the transit company's situation, which is so disturbing.

The Jersey's doctrine requiring strict burden of proof puts a premium on quibbling and delay. It puts a weapon in the hands of political-minded rate increase opponents who can use it to hamstring a perfectly reasonable and necessary utility rate increase, for weeks and even months, solely because the utility company might be unable, on short notice, to prove that certain expenditures were made or were even reasonable.

This would seem to be a cold-blooded "show me" kind of doctrine, one which would more readily be expected from Missouri than from New Jersey. But it might be said, in passing, that Missouri and Wisconsin — to name two states where important telephone rate cases have recently been decided—have taken a more realistic attitude on this question of requiring a utility company to prove its expenditures as well as to justify them.

It is the weight of authority which makes this correspondent suggest, with all deference for Chief Justice Vanderbilt's admitted reputation as a legal scholar, that the New Jersey decision may represent some bad law. Any lawyer, or other person familiar with regulatory procedure, can readily point to the universal weight of court and commission authority. These cases all say, plainly, that a utility's books showing the fact of payment and the reasonableness of expenditures *should be presumed to be correct* (except as to transactions with affiliates). Yet, in the face of this well-settled body of law, the utilities are faced with the possibility that the New Jersey doctrine will be widely used by the opponents of rate increases to delay and hamper such proceedings.

To make the point clearer, in layman's language, let us suppose that a telephone company laid out an investment of $10,000 for a certain section of pole line in 1940. Let us say that the utility company's books show entries indicating (1) that the poles were ordered and delivered, and (2) that a contractor was paid for setting them in place and rigging them for wire. Assume that these are "old" entries. They were made long before there was any thought of the use of such data in justifying a rate increase.

But now, 15 years later, a court comes along and says to the telephone company: "You will have to prove that these poles were bought, delivered, and paid for, and are now in operation. After that, you will have to prove that you paid a reasonable amount."

There is little doubt that the average telephone company, given enough time, plus a whale of a lot of trouble and expense, can prove the correctness and

reasonableness of such expenditures. *That is precisely the point at issue!* The court imposes upon the telephone company a seemingly unnecessary burden of time-consuming effort and expense, while there is a delay for weeks, possibly months, in granting the necessary relief through the rate increase requested.

Imagine what would happen in the course of ordinary retail business affairs, if department stores and merchants had to make such proof *before* they could legally enforce collection of credit accounts for sales to retail customers. Instead of relying on the familiar doctrine of "account stated" the department store would have to show, in some way, that the particular sales were made, that the merchandise was delivered, and—most difficult of all — that the *price* was reasonable. How, for example, could a milliner go about justifying the "reasonableness" of some of these ladies' hats, which look like mangled lampshades, but nevertheless sell for $20 or so?

It was over 30 years ago that a U. S. District Court decided this point in a manner quite contrary to the conclusion reached in the New Jersey case. This was the case of the Consolidated Gas Co. *v.* Newton, PUR 1920F 483, 257 Fed 231, in which federal judge Learned Hand said:

"Books kept in accordance with orders lawfully promulgated by the commission under such powers are on a different footing, in a suit based upon the action of the state and against its officers, from even the same books, if attempted to be used elsewhere. They have a public character, derived from the supervision which can be and is exercised over them. The authorities are not, of course, bound by them in any event; but, prepared as they are, under their direct and constant supervision, they can scarcely be put in the category of the usual ex parte entries about whose admission the cases are concerned.

"The state, having had so much hand in their creation and such continuous power of examining them, should not be entitled to demand a verification first hand of every item by common-law proof, before they become prima facie competent. The guaranty of their truth is sufficiently established by the scrutiny to which they are always subject, and the penalties which follow upon a disregard of the commission's orders. It would, indeed, be an incredible burden to require every item to be separately established, and even these defendants have not gone so far as that; but, if the books are not prima facie competent, they might call for such proof, nor can I reject them without putting the company upon their mercy."

This decision was reviewed, and sustained on this point by the U. S. Supreme Court a year later. (258 U. S. 165.)

REA Loans Allocated in Current Fiscal Year

The following rural telephone loans have been allocated by the Rural Electrification Administration during the current fiscal year beginning July 1. (See Page 18 of the July 15 issue of TELEPHONY for all previous loans allocated by REA):

JULY 7. Abercrombie (N. D.) Telephone Co., $142,000.

JULY 28. Yadkin Valley Telephone Membership Corp., Yadkinville, N. C., $518,000.

AUG. 2. Yorkville (Tenn.) Mutual Telephone Co., $124,000.

AUG. 7. Danielson & Comer Telephone Co., Comer, Ga., $249,000.

AUG. 14. Hancock Rural Telephone Corp., Greenville, Ind. (merger of five former farmer-owned mutuals), $164,000.

AUG. 14. Peoples Telephone Co., Collinsville, Ala., $366,000.

Of course, the presumption of correctness which the courts and commissions have always attached to utility records is not absolute. It is what the lawyers call a "rebuttable" presumption. In other words, if there is a real reason to question any item of cost, or investment, the regulatory commission has a right to look into it, and see that everything is in good order.

But that is precisely the trouble with the New Jersey decision. The utility companies do not object to having such items questioned for good reason. The objection is the *burden of proof*. In every other state in the Union (except New Jersey), it is the party who questions the correctness of the utility's books, who must bring in proof that there is anything wrong. Under the New Jersey decision, it is apparently up to the utility company to supply the proof of every entry in its books before such entries will even be received as evidence in rate cases.

For those readers who may want to be on the watch for opposition in rate cases based on the New Jersey doctrine, here is a list of authorities in support of the holding quoted above from Judge Hand's opinion:

Justice Brandeis in his famous concurring opinion in the Southwestern Bell Telephone Case (1923) PUR 1923C 193, 262 U. S. 276, said: "Every (utility) investment may be assumed to have been made in the exercise of reasonable judgment, unless the contrary is shown."

Two more U. S. Supreme Court rulings in the same direction were: (1) Pacific Telephone & Telegraph Co. *v.* Whitcomb (1926) PUR 1926 D 815, 276 U. S. 97, wherein an unsuccessful attack was made on the reasonableness of a telephone company's investment in switching apparatus; (2) Wisconsin Telephone Co. against Public Service Commission, 309 U. S. 657 (affirming PUR 1932B 195), which upheld a Wisconsin Supreme Court ruling that "the amount which should be expended by a public utility in the operation of its plant is, in the first instance, a question for the management."

For another decision, along the same line, but of more recent vintage, we have the Vermont Supreme Court saying just last year (1949) in the New England Telephone & Telegraph Case (79 PUR NS 508) with respect to certain questioned operating expenses:

". . . This matter of salaries and advertising expense calls for the exercise of judgment on the part of the management of the company. Good faith on its part is to be presumed. Although these expenses should be scrutinized with care by the commission they should not be disallowed or reduced unless it clearly appears that they are excessive or unwarranted or incurred in bad faith."

The Maryland Court Differs

Just by way of contrast, we had a very interesting decision, handed down last month, in another transit case—this time in Baltimore, Md. — which moves in the opposite direction. This was the Baltimore Transit Co. case. The Maryland Public Service Commission did not question the correctness of the utility company's books of account. But it questioned the correctness of the utility company's *good business judgment*, in even asking a rate increase at all!

For some months, the Baltimore Transit Co. has been having a difficult time operating on a 13-cent fare. So it asked the state commission for authority to increase the fare to 15 cents. The commission said, in effect: "No. Such a high fare would only scare away more business. You would be worse off than ever." The utility company took the view that the company's management ought to be the best judge of that risk. And that is the view taken by the state's highest court—the Maryland Court of Appeals—which sustained the transit fare increase.

The court ruled that the 15-cent fare should be allowed because the lower fare (now in effect) does not enable the transit company to make ends meet. The commission's refusal to grant the increase was based on its

(Please turn to page 28)

ABC of the Telephone

By FRANK E. LEE

MULTIPLE line key equipment offers many practical advantages to the operating telephone company. Generally speaking, these units represent one of the easiest means of providing a subscriber with access to two or more central office lines.

Having access to a number of central office lines means that with one telephone instrument the subscriber can use any one of these lines. For all practical purposes, the same features that are available with central office lines also are possible with PBX terminal connections. Obviously, there are many practical advantages to be gained from arrangements of this type. Perhaps the most important of these advantages is the possibility of completing more calls for a busy subscriber with the use of a minimum of telephone equipment. At the same time, as will be developed later, multiple line key equipment offers more operating convenience and ease of use than would be possible with individual instrument termination for each trunk line.

A multiple line key equipment system consists of one or more telephones with associated keys and necessary auxiliary operating equipment. The exact type of apparatus or equipment combinations to be provided for a particular installation will depend upon two important factors:

(1) The operating features desired by the subscriber.

(2) The actual conditions under which the subscriber intends to use the equipment.

Typical Nomenclature for Multiple Line Key Equipment

A description of multiple line key equipment circuits will be better understood if there is a familiarity with the names, or nomenclature, of important parts or features of the various plans. While the exact wording of each of the following terms may vary with each manufacturer, there usually is a desire to make the name of the feature serve as a key to the function of the particular feature. Based on this idea, following are the important terms associated with most types of multiple line key equipment:

PART LI. Multiple Line Key Equipment—Section I. The preceding article in this series appeared in the June 17 issue, p. 18.

Master Station. In any multiple line key equipment system there must be at least one master station. However, as the needs of the customer may require, there can be more than one master station in a particular system. Actually, master stations are the principal stations, and as such, usually control certain features of the system or plan.

Sub-Station. The sub-station can be considered as subordinate to the master station. Generally a sub-station is not equipped with all of the operating features provided in the master station. When the need arises, a sub-

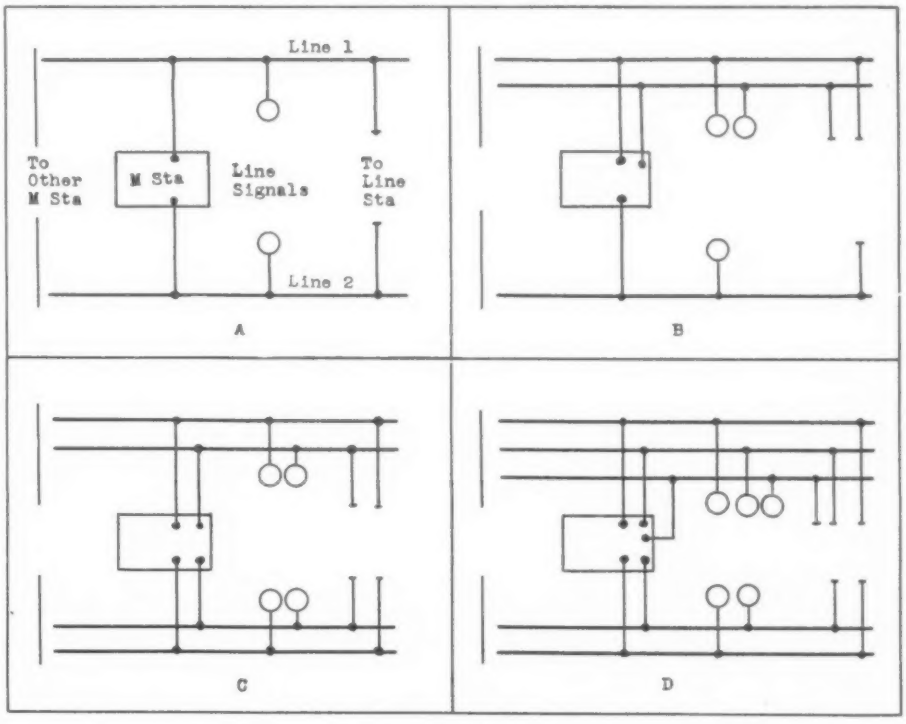

Fig. 1

station can be wired to be dependent upon a master station for many of its functions. Thus, a certain privacy of conversation is made available over a master station. Flexibility or utility of service is provided by the sub-stations. With these general arrangements, many desirable systems or plans are available to supply the most exacting requirements.

Line Station. A line station is connected permanently to a PBX switchboard or central office trunk line. In this manner the line station is independent of all key operation. As a result, a line station is always in a position to receive or originate a call no matter how the keys on the balance of the equipment are arranged.

Local Station. A local station has access only to a local communicating line within the system. In some systems this feature is labelled as an intercommunicating line. Usually, master stations and sub-stations also have access to the local station circuit.

Selection. Selection is a feature controlled by a key which permits the customer to connect a talking circuit to any one of two or more lines that are available for use. Usually the incoming ringing signal is independent of key operation. With this arrangement the signal is always connected to indicate a call waiting on the line. However, when desirable, a key controlled ringer cut-off usually can be provided. In many instances, where both audible and visual signals are installed, the audible feature may be key-controlled. This provides for quieter and less annoying service in a busy office where incoming calls are given constant supervision.

Hold. As the name implies, hold is a key operated feature that enables the customer to hold one line while a call is being originated or answered on another line. The line or lines being held may be reselected by the original station or by any other station having access to the line. The most flexibility is provided when the held line can be reselected and used irrespective of the position of the hold key at the original station.

Local Talk. Local talk is provided by the local or intercommunicating line. This feature permits conversations to be held between stations in the system that are equipped with local lines. The local line can be put in use without utilizing or interfering with the central office trunks or PBX lines associated with the plan. In most installations a system of push buttons and buzzers are arranged to provide signals for the use of the local line.

Manual Cut-Off. Manual cut-off is a feature that enables the user of a master station to connect or disconnect any sub-station that may be connected to the same line. Generally, this feature is such that the master station

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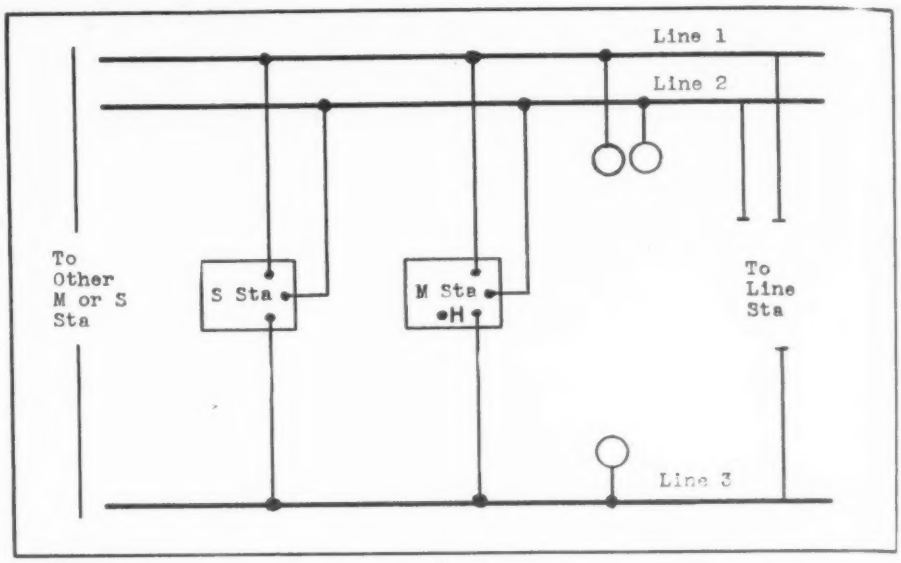


Fig. 2

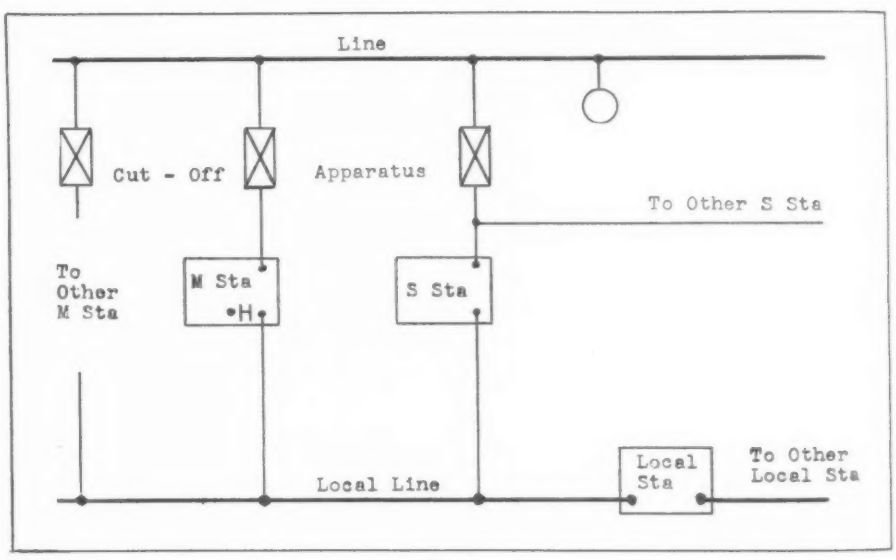


Fig. 3

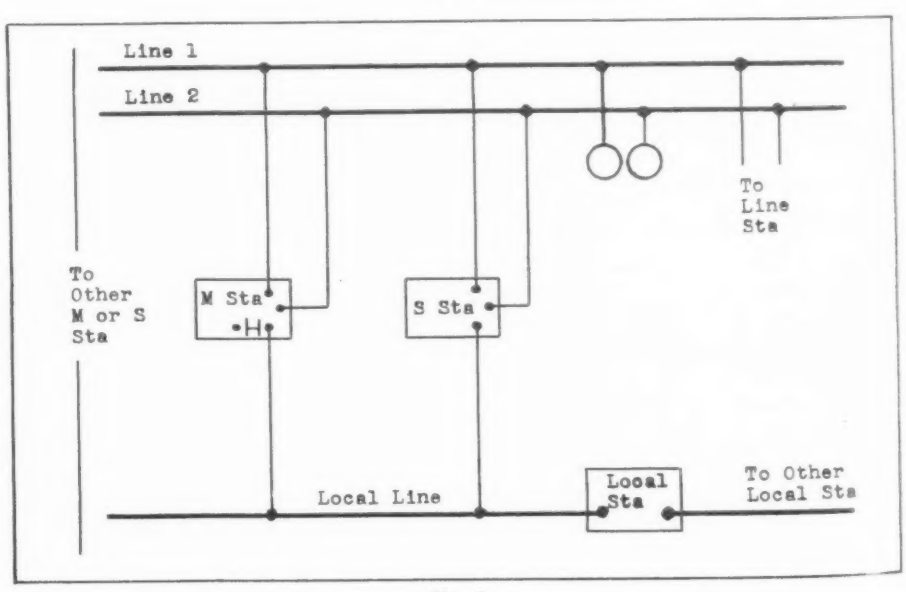


Fig. 4

ENGINEERING THE CABLE PLANT

By RAY BLAIN
TELEPHONY's Technical Editor

THE proper engineering of the exchange cable distribution plant in the present-day telephone system is most important. During and after World War II there was a great demand for telephone service and customers were willing to accept two or four-party line service when those types only were available. However, the average individual now makes use of the telephone more frequently than he did in those days and often party line service is not considered adequate.

This situation results in a big demand for an up-grading of service which usually requires an expansion of the cable distribution plant. Such demands, added to the general building boom now in progress throughout the country, make it essential to expand the cable system considerably in the average exchange. In the engineering of cable plant changes, certain rules should be observed with a view to providing the ultimate service capacity required over a pre-determined number of years in the future. It is the purpose of this article to explain some of the fundamental principles that should receive consideration when planning rehabilitation or changes in the exchange cable plant.

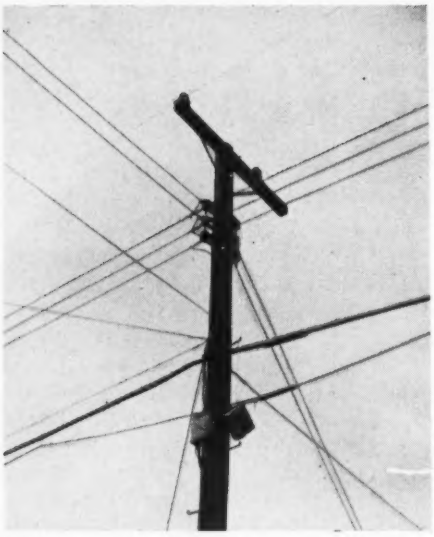
In the engineering of exchange cable plant, the first point to be considered is the type of construction to be employed. In general, four different types should be considered, i.e., aerial, underground in conduit, subterranean and buried. While cost will always be of primary consideration—and this should include the maintenance costs over a period of years—frequently, other elements may prove to be the deciding factor.

As a rule, a preliminary survey should be made when new construction is contemplated, and a decision made as to what type of plant will prove the most desirable and economical in a specific locality.

Aerial plant generally will prove the most economical to serve residential areas in the small and medium-sized exchanges. However, there may be exceptions to this rule. In some special cases, because of tree interference or where proper power clearance cannot be obtained, some type of underground construction will prove the most desirable. Ordinarily, the most economical type of aerial cable distribution is to utilize jointly owned power poles. These poles must, however, be of adequate length in order to provide proper clearance between the two services. Jointly used poles may be located either in the streets or along alleys, in the rear of property lines. The alley location is to be preferred since it facilitates the running of drop wire.

In the design of aerial plant, whether on separate or jointly used poles, proper clearances should be provided in all cases. If prescribed clearances cannot be obtained between aerial cables and power circuits, transformers and trolleys, then some type of underground construction should be seriously considered despite its higher cost. Not only will accidental power contact with cable cause serious service interruptions and costly maintenance, but it will also prove a hazard to telephone employes. Ornamental trees, when proper clearance cannot be secured by trimming, will also prove detrimental to aerial cable and materially increase maintenance costs. In some sections of the country, squirrels

Examples of inadequate clearance between telephone and power lines.



Replacing a new cable with one of larger capacity.

gnaw the lead sheath of aerial cable which likewise results in the increase of maintenance costs. It readily may be seen that under certain conditions aerial cable does not prove the best investment when its maintenance is considered over a term of years even though its first cost may be much less than underground construction.

In general, underground cable in conduit is considered the best type of distribution both from a service and maintenance standpoint, under all conditions. In this type of construction, the conduit sections must be connected by suitable manholes for use as splicing points. Conduit structures are usually classed as main and lateral runs. The conduit runs which follow the main wire routes, from which branch runs extend, are usually considered a main conduit. The branch runs from this main route are often referred to as lateral or subsidiary runs.

The routes for conduit structures should be planned to provide the most direct run from the area being served to the central office. Where feasible, conduit runs should be located in parkways rather than under paved streets or alleys in order to facilitate future repairs and changes. When selecting a route for new conduit construction, careful consideration should be given to the following: Soil conditions, present and future locations of sewer, water, gas, power and other utility services, and the proximity of trees, the roots of which may enter ducts later and cause obstructions. Lateral conduits should be routed in the main conduit trench insofar as possible, especially where paved street crossings are involved. Lateral conduit runs into buildings should be routed so that entrances may be made at the most convenient point.

Conduit sections are usually planned so that manholes may be placed approximately at 400 to 500-ft. intervals. The length of sections are generally limited by the main points of distribution, such as street intersections, alley entrances, large buildings, etc. It is possible to provide longer conduit sections on a straight rather than on a curved run. In general, however, a section longer than 600 ft. is not desirable where large cables are to be used.

In all cases, care should be exercised to make certain that the maximum number of ducts necessary to meet the ultimate requirements, with one spare, is provided in each section. At least two conduits should be used to collect all manholes. This provides a minimum of one in use, and one spare for utilization in the event of trouble. However, while the trench is open, it costs very little additional to place a few extra ducts to be used in the event they are required. If three ducts are to be used on the initial installation, then at least four should be provided, but six or eight might prove a better investment. When additional ducts must be added to a run at some future date, the cost may well be enormous. Many companies that did not properly engineer their conduit structures years ago must now suffer the expense of removing old cables and replacing them with larger sizes. In many cases, it has been necessary to remove 400-pair cables and replace them with 1,200 pairs, and, in some cases, even larger. This is no reflection on engineering work

Sectional steel manhole form ready for concrete.

A situation where the telephone company must replace a new cable with a larger size.

of a few years ago, for at that time there were no accurate means of forecasting the tremendous increase in cable plant requirements now experienced. Engineers of today have a better idea of the probable continued growth of telephone plant and may, therefore, engineer so as to provide a greater conduit capacity to adequately care for ultimate future growth.

Various types of conduit are now available, all of which will prove entirely satisfactory, if used properly. Multiple vitrified clay conduit is often used for main runs where four or more ducts are required. Single clay duct is also used occasionally for subsidiary runs. Fibre and cement-asbestos, which comes in longer lengths than clay, are both now used extensively. These types of conduit may be installed either with or without concrete protection, depending upon local conditions. Creosoted wood or pump log, formerly used extensively, is now employed to a limited extent in some sections of the country. Wrought iron or steel pipe is used to a limited extent on some special jobs although its high cost rules it out for average conduit runs. Ducts in main runs should be of sufficient size to accommodate full-sized cables, not less than $3\frac{1}{2}$ inches in diameter.

Conduit protection should be provided as and when required. This protection, when used, generally consists of creosoted plank or a concrete envelope. When a conduit structure is built in good firm earth, and heavy vehicular traffic will not pass over it, usually neither base nor top protection is considered necessary. When concrete protection is required, a mix of 1-4-8 is considered sufficient. When the ground is soft or springy, a concrete base about four inches thick should extend the full width of the trench. Conduit runs

should be graded to drain into one or both manholes of the section.

Manholes form a most important part of the conduit structure and should be designed, located and constructed with extreme care. In general, manholes should be located at all junction points on the conduit runs. They must also be located as required along a conduit run to provide sections of a practical length. Usually, manholes are located near street intersections and preferably in the parkway. When a manhole is located in a street, a barricade must be erected each time one is opened which always proves a traffic hazard and slows up the work to a great extent. It is always a good plan to design manholes of adequate size to provide proper working space. Skimping on the size of manholes is false economy in every case as they do not provide ample space for splicing or racking. Make certain, also, that manholes are of sufficient depth in order that cables may be racked about three feet above the floor. Never rack cables in a manhole so that the splicer must reach above his head to wipe a joint. Make certain, too, that there is a large cover on all manholes. As a general rule, this cover should be at least 27 ins. in diameter. The 21-in. cover, sometimes used, is entirely too small to provide proper working space and is always a handicap to the splicer.

Usually, the eight and six-foot manholes have a width of three feet, six inches. The four-foot size is usually three feet wide. Headroom should be at least five feet and six feet or more is still better. Provide a brick collar under the cover in every case so that an adjustment may be made if the grade changes without wrecking a perfectly good manhole. Make certain also that manholes are drained properly either by the use of a sump pump or by a connection into a storm sewer. When a sewer connection is used, however, it must be equipped with a gas trap. Sewer gas proves deadly to workmen if permitted to escape into manholes.

For the most part, concrete is now standard for use in the construction of manholes. If a sectional steel manhole form is used and ready mixed concrete is procured, the construction of adequate manholes becomes a comparatively simple task. Concrete may be mixed on the job; however, when ready mixed concrete can be obtained, it will prove both economical and convenient. Usually, a concrete mix of 1-2-4 or 1-3-5 is considered adequate for manhole construction. Extra strength is provided by the use of standard reinforcement rods which are set in place prior to the pouring of concrete. Standard steel forms are drilled so that concrete inserts may be used for the mounting of cable racks. Pulling-in irons can be set in their proper place before pouring which saves the labor of drilling the finished concrete later.

Brick manholes have been used to some extent in the past, but their use has now practically been discontinued because of their high cost. Attempts have been made from time to time to construct pre-cast manholes, but because of their excessive weight the cost of installation has proved excessive except in those cases where special handling machinery is available. Small pre-cast manholes in sections also have been used to some extent to provide splicing points in buried cable.

Generally, buried cable, in telephone parlance, means plain lead covered cable buried in the ground without mechanical protection of any kind. While installations of this nature have in many cases proved satisfactory, this type of construction cannot be recommended for general use. Although a sandy soil may prove satisfactory for burying lead cable, other soils may contain chemicals that will cause harmful corrosion of the lead sheath.

Formerly, jute protected cable was used extensively for exchange distribution, but experience has proved that this arrangement did not provide adequate protection against rodents and corrosion and its use has practically been discontinued. Nearly all telephone engineers now recommend the use of steel tape armored cable, generally referred to as subterranean type, for use on all buried cable installations. The steel tape armor does not increase the cost materially when the reduced maintenance cost over a period of years is properly evaluated.

The use of buried or subterranean cable will prove an advantage in a few special cases. However, its use should be recommended only after careful consideration of all the factors involved. When a buried cable can be installed for a considerable distance to serve a factory or similar type facility, located in an isolated section where increased building activity is not probable, it may prove a worth while investment. Even in these isolated cases, every precaution should be taken to provide a cable of sufficient capacity to adequately serve the ultimate requirements. Frequently, in recent years, a building boom has started in isolated areas where a need for an increase in telephone facilities was not considered possible. The reinforcement of a buried cable is both expensive and difficult. A buried cable should be of sufficient size to serve an area for a period of at least 20 years without a need of reinforcement. If reinforcement is required within eight to 10 years, a conduit system is considered more desirable. When ample conduit facilities are available, full flexibility is provided and cable rearrangements and expansion prove comparatively simple. Cable extensions into outlying areas are greatly facilitated by a conduit system and always prove most expensive when feeder cables are of the buried type. This in itself is a most important factor when we consider the present day trend in most towns and cities to move into the suburban areas.

However, tape armored buried cable has proved extremely satisfactory in the provision of toll and trunk facilities where the ultimate circuit requirements can be forecast with a considerable degree of accuracy. On installations of this type, the use of wire armored cable is recommended for crossing swamp areas as steel tape armor does not provide adequate tensile strength. In general, buried cable should have a minimum cover of 30 ins. This should be increased to 50 ins. under roads and streets.

Frequently, buried cables may be used to advantage in the provision of service connections into buildings where aerial drop wire proves objectionable. Moisture-proof cable terminals may be installed in manholes for use in the connection of these service cables into the main feeder cables. In some cases, cable terminals are installed on pedestals to provide a connection point between underground feeder cables and buried type service connections. This practice is not recommended except in special cases where suitable space is available for installation of the pedestals. In special cases, also, a buried cable may be used to provide service into large buildings, such as apartment houses, when the ultimate requirements are definitely known. It is extremely doubtful, however, that this practice proves desirable in most cases as a conduit facilitates cable changes and repairs not possible even when short lengths of buried cable are involved.

In general, 19, 22 and 24-gauge cables are used in exchange plant distribution, although 26 and 28-gauge also are used to a limited extent. The 28-gauge cable was developed during World War II with a view to conserving copper and lead. In some few special instances, 16-gauge cable may be used although this is rare for it usually proves more economical to use a finer gauge with loading. The 19-gauge can be obtained in sizes from six to 455 pairs; 22-gauge from 11 to 909 pairs;

(Please turn to page 22)

before you convert to dial

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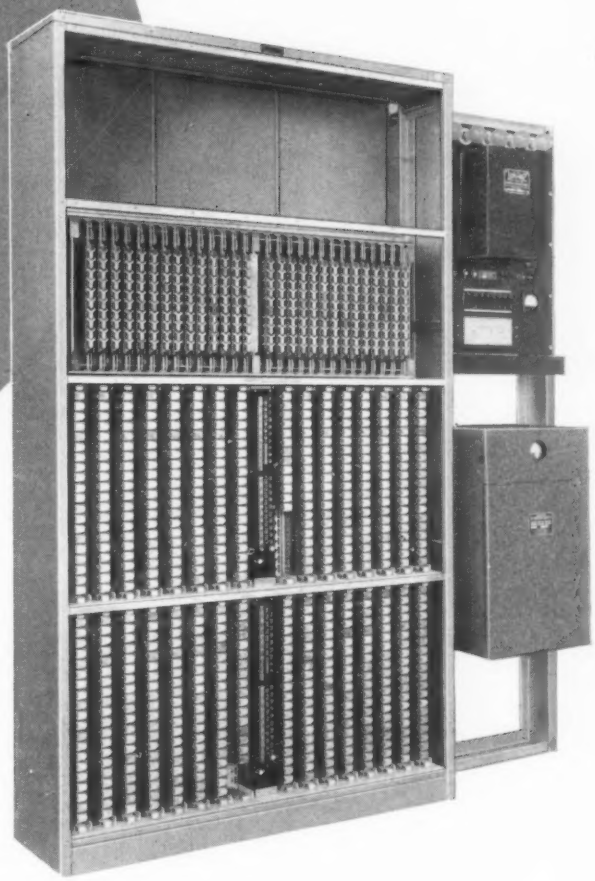
talk with the owner of a Leich Dial System near you . . .



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Ask him if he has had any experience with any other type dial switchboards and how the Leich Dial System compares with them. Ask him if he can see where and how the Leich System is helping him make more money than he made before.

Ask him frankly, if he thinks he's made a practical and *profitable* investment. Ask also, if Leich hasn't lived up to their delivery schedule and all other obligations one hundred per cent.

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MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907

24-gauge from 11 to 1,515 pairs; 26-gauge from 11 to 2,121 pairs, and 28-gauge from 11 to 303 pairs. It is doubtful if 28-gauge cable will ever be used to a great extent. The 16-gauge may be obtained from 26 to 152 pairs on special order.

In the writer's opinion, errors are frequently made in providing cables that are under-size rather than too large. We have heard frequent complaints of cables being too small, but none of cables being too large. Neither do we agree that 16-pair cable serves a legitimate purpose in present day exchange plant. If you expect to have an ultimate need for 16 pairs in any cable, we believe that the installation of 26 pairs is justified. In fact, we seriously doubt that 11-pair cable can be used to advantage and that an overall gain could be realized by using nothing smaller than 26-pair cables. The cost of 26 pairs over 11 or 16 pairs is only slight and the additional capacity is used so often that on an average the larger size will prove a better investment in practically every case.

Neither do we agree that the use of 76, 151 or 303-pair cable can be justified, except in special cases, in the average exchange. In our opinion, when these sizes are indicated as required, 101, 202 and 404 pairs will prove a much better investment.

Composite cables, in which two or more sizes of conductors are covered by one sheath, are not commonly used in present day exchange plant. This type of cable is usually made up "special," is expensive, and, in most cases, two separate cables will prove more desirable and economical. Reinforcement of composite cables is in all cases expensive and difficult.

Quadded cables, in which the conductors are arranged in quads or groups of two pairs each so as to provide suitable characteristics for the use of phantom circuits, can be used to advantage only for toll entrance cables to carry open wire toll lines into the exchange, or for toll or trunk circuits. This type of cable requires special skills in splicing in that quads must be balanced accurately in order to eliminate noise. Quadded cable may be used in either aerial or underground plant or a combination of both.

As a rule, special cables should be considered for use to meet unusual conditions only where standard materials will not provide the desired facility. Corrosion-protected cable may be installed in conduit in locations where the cable sheath is subjected to corrosive action which cannot be mitigated economically by any other means. In this type of cable, the protection over the lead sheath consists of two wrapped layers of sisalcraft paper and an outer layer of rubber-filled tape. The entire covering over the lead sheath is then flooded with an asphalt compound.

Special tape armored cable, designed for aerial plant installation, may be used in locations where plain lead covered does not prove adequate. For example, this cable may be used to advantage near a stone quarry where ordinary lead sheath cannot withstand flying rock particles. This cable also can be used propitiously in locations where shielding from low frequency induction is required on aerial cable leads. It also provides adequate protection against abrasion where aerial cable passes through trees that cannot be trimmed. In this cable, the outside mechanical protection consists of a bedding of jute without asphalt which is covered over with two spiral wrappings of galvanized steel tapes.

In the average present-day exchange, the customer's loops may consist of 22, 24 or 26-gauge cables or a combination of these gauges. Occasionally, some 19-gauge may even be used to advantage to meet unusual conditions. When considering relative plant costs, transmission and signalling requirements may be met by gauge of conductors or by gauge considered in connection with loading, special telephone instruments, long line terminating equipment, etc. Comparison of annual charges because of the use of several different facilities may be used as an indication of relative costs. Suppose, for example, we consider the annual charge for 24-gauge cable, plus the cost of loading as compared to the annual cost of unloaded 22-gauge cable in an exchange where either will meet the transmission and signalling requirements. In general, 26-gauge will not prove in over 24-gauge, or either size over 22-gauge, because of the cost of the transmission and signalling expedients required by the finer gauge. The use of 22-gauge in lieu of 19-gauge usually proves economical when the same rule is applied.

The established practice with reference to customer's loop plant design is to set a loop limit in db for each exchange which represents the combined transmission and receiving losses, (T + R). With this in view, the cable plant should be designed so that the local (T + R) losses will not exceed the loop limit for the exchange under consideration.

In the preparation of a study to determine whether a certain loop plan will meet the prescribed requirements, the following factors should be carefully considered:

(1) The transmitting and receiving losses for the proposed loop and the type of telephone to be used.
(2) Long circuit line losses.
(3) Impairments due to line noise.
(4) Losses due to bridged taps.
(5) PBX losses.
(6) Losses due to differences in terminal junctions.

The following factors also should be considered when determining the gauge conductors to be used in the exchange cable plant:

(1) Small gauge conductors should be located at the central office end as larger cables may be used and less duct space utilized.

(2) Heavy gauge conductors should be used in branch feeder cables, even though they are not required to meet transmission limits when used in combination with heavy gauge conductors existing in the main feeder cables. Their use is warranted in that it permits future replacement of the large-gauge main feeder conductors with small gauge conductors to defer reinforcement of the duct structure.

(3) Concentrate large-gauge conductors in the branch feeder cables since each serves a number of distribution cables.

(4) Smaller gauge conductors should be used in the distributing cables since they are usually so short that little gain may be had by the use of larger gauges.

(5) Ordinarily, small gauge cable should not be placed beyond the distance considered the limit for a hypothetical line made up entirely of that gauge of cable.

In the engineering of any cable system, the maximum fill which is the percentage of total pairs that can be used in a cable safely and economically without seriously affecting service is a most important consideration. This is less than 100 per cent by the percentage of cable pairs, which are:

(1) Defective and cannot be cleared at a reasonable cost.
(2) Required to maintain service while clearing trouble on other pairs in the same cable.
(3) Not available at the points required.

Consideration of the expected growth along the route of a proposed cable is most important. Expensive mistakes are frequently made at the present time by being too conservative in growth estimates. Growth expected within a year can generally be forecast with reasonable accuracy, but for longer periods the estimate becomes an educated guess in most cases, and less reliable. Also, the growth estimate that involves large areas is usually more accurate than one covering a small area. During the past several years, or since the end of the war, telephone growth has been phenominal and engineers have learned that their growth estimates in general have been

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entirely out of line. This has resulted in the installation of several cables on one pole line and a congestion of ducts in underground systems. Frequently, replacement of existing cables with a larger size has imposed a terrific expense that could not be reflected in the rate structures of various operating telephone companies.

In general, all efforts should be directed toward the design of a cable system as required to meet a definite line distribution with a reasonable degree of flexibility. The degree of flexibility will vary considerably with local conditions. It should be kept in mind, however, that flexibility, which is always desirable as a cable nears its maximum fill, must be provided by carrying an increased investment during this period of fill.

In some exchanges, the investment caused by providing this increased flexibility, which also increases fixed charges and maintenance costs, may never be required. By the same token, lower maximum fill which results from a less flexible design may require plant additions and cable reinforcements with increased investment and carrying charges. Careful consideration of both extremes should indicate a compromise with a view to combining all of the desirable features of over-all economy and practicability.

In the design of new cable plant, or changes in existing plant, the engineer should consider the following points in order to reduce to a minimum the loss of efficiency or fill which will cause pairs to be out of service or for some reason make them unavailable for immediate use:

(1) The known ultimate distribution and feeder areas to be served. This must consider line density, transmission and gauge of conductors.
(2) The location and size of terminals required for distribution.
(3) The multiple arrangement to be used.
(4) Cable sizes to be used by sections.
(5) Relief points to be provided.
(6) Cross-connected terminals to be used.

A careful study of these factors in connection with existing cables which are congested or are approaching congestion may indicate trends that will prove useful in future engineering studies of exchange cable plant. This continual analysis of congested cables may establish certain working limits that will prove useful in your particular exchange or area.

The selection of the size and number of cable terminals to be used is a most important consideration in cable plant design. This determination is influenced by line requirements and is most important in providing flexibility of a given cable. A terminal of sufficient size will also provide a reasonable margin of insurance to permit fluctuations in station movement. The trend at the present time in many exchanges appears to be toward the use of a greater number of smaller terminals than formerly. For example, it is now common practice to install an 11-pair terminal on practically all poles on aerial leads serving residential areas, whereas at one time a single 26-pair terminal per block was considered ample. This practice reduces the use of drop wire and provides greater flexibility if a proper multiplying arrangement is used. The use of the 16-pair terminal appears to be on the decline.

The old cross-connecting terminal, extensively used in the early days of telephony and then practically dropped for many years, appears to be staging a comeback in many of our larger exchanges. These terminals are used to connect feeder cables to main cables to increase the efficiency by providing a higher degree of flexibility. Actually, cross-connection provides a choice of feeder cable pairs on working lines. This arrangement further provides some control of the distribution of working pairs in the feeder cables which tends to make distribution independent of the geographical location of the working telephone.

It must be remembered, however, that the use of a system of cross-connection involves considerable initial expense and some increase in maintenance and installation and removal costs. It is best, therefore, to compare the cost of cross-connections in each exchange with other known methods of obtaining the same benefits.

The engineering of the exchange cable plant is a big subject and it must be admitted that we have merely scratched the surface in this article. It is hoped, however, that for those of you who may need information on this subject, we have directed your thoughts into the proper channels so that continued investigation on your part will produce the desired results.

If our country is to be faced with an all-out war—and we sincerely hope we will not—the burden to be placed upon all operating telephone companies will be enormous. Communication requirements for the next war will undoubtedly be increased greatly over what was used in World War II. Cable is certain to be a critical item and every effort must be made to obtain the highest efficiency from what we may have. In this connection, we believe that thermoplastic will relieve the lead shortage to a great extent, but, at the same time, we seriously doubt that anyone will ever be able to obtain a substitute for copper for use as conductors in telephone cables. Regardless of what comes, telephone people everywhere will do a good job with what they have available. Of this, we are certain.

ABC of the Telephone

(Continued from page 16)

can be used whether or not the sub-stations are connected or disconnected.

Relay Cut-Off. In some systems an automatic relay cut-off can be provided to disconnect sub-stations when master stations are in use. Generally, the relay cut-off feature has a wide latitude of application. For example, when a master station selects a line, all other stations are cut off. When a sub-station selects a line, all master stations are excluded from the line, but other sub-stations are not excluded. At first glance this arrangement would appear to place the sub-station in the same category as a master station. Such is not the case. The relay cut-off feature merely provides a certain degree of freedom from interruption in the originating and answering of calls.

Types of Systems Available

As mentioned previously, there are a number of multiple line key equipment systems available. The customer's requirements are usually the controlling factor as to which systems should be used on a particular installation. The primary use for multiple line key equipment systems is on individual lines or on PBX terminal lines.

To insure the best all-round transmission results, manufacturers generally recommend that these systems be arranged so that not more than five stations can be connected to one line. This recommendation is made to reduce the possibility that a line will be used simultaneously by a number of stations. Typical reasons for multiple usage of a line would be for listening-in or for conference circuits. Circuits used for either of these purposes should be equipped with special apparatus to avoid serious transmission losses. Fewer stations on a line also reduce the chance of interference on outgoing dial calls.

Unless a holding feature is provided, there usually should be at least one station for each central office or PBX terminal line that is associated with the multiple line key system.

Some systems are arranged for selection only. As shown in *Fig. 1-A*, the master station has access to two lines. Inasmuch as there are no other features provided, other stations in this group would also be designated as master stations.

Connection of the ringers at this particular station is optional. The ringers can be connected at any station or stations in the group.

Figs. 1-B, 1-C, and *1-D* illustrate how the master station can be equipped to select from three, four, or five lines.

The actual type of switching apparatus used may vary with the equipment being used. Some systems may use externally mounted key units that can be attached to a wall, table, or desk. Other systems may use push button switching apparatus that is an integral part of the telephone instrument. Also, certain systems may use key boxes or cabinets complete with line and busy lamps and the necessary select and hold keys.

Fig. 2 illustrates how a master station is arranged to select and hold on any one of three lines and to hold any connection as desired. In this particular system, the hold feature is not included in the sub-station circuit. The hold feature usually consists of a resistance that can be connected across a line by the operation of a key or push button. As a general rule, the value of this resistance is approximately the same as the resistance of the transmitter circuit used in the telephone set.

In most circuits the holding short cannot be placed across the line until the circuit action of the equipment has progressed to a certain point. Through this arrangement accidental operation of the hold key will not place an idle line out of service.

The circuit shown in *Fig. 3* illustrates how a local talk or intercommunication line can be incorporated with selection and holding features. The master station is provided with the following features:

(1) Selection.
(2) Hold.
(3) Access to local talk line.

The sub-station has the selection feature plus access to the local talk line. The local station has access only to the local talk line.

Fig. 4 illustrates the principle of a relay cut-off system. As a general rule, the cut-off feature is provided to insure an uninterrupted connection and consequent improved transmission. When a master station uses a particular line, all other stations on the line are cut off. When a sub-station uses

(Please turn to page 28)

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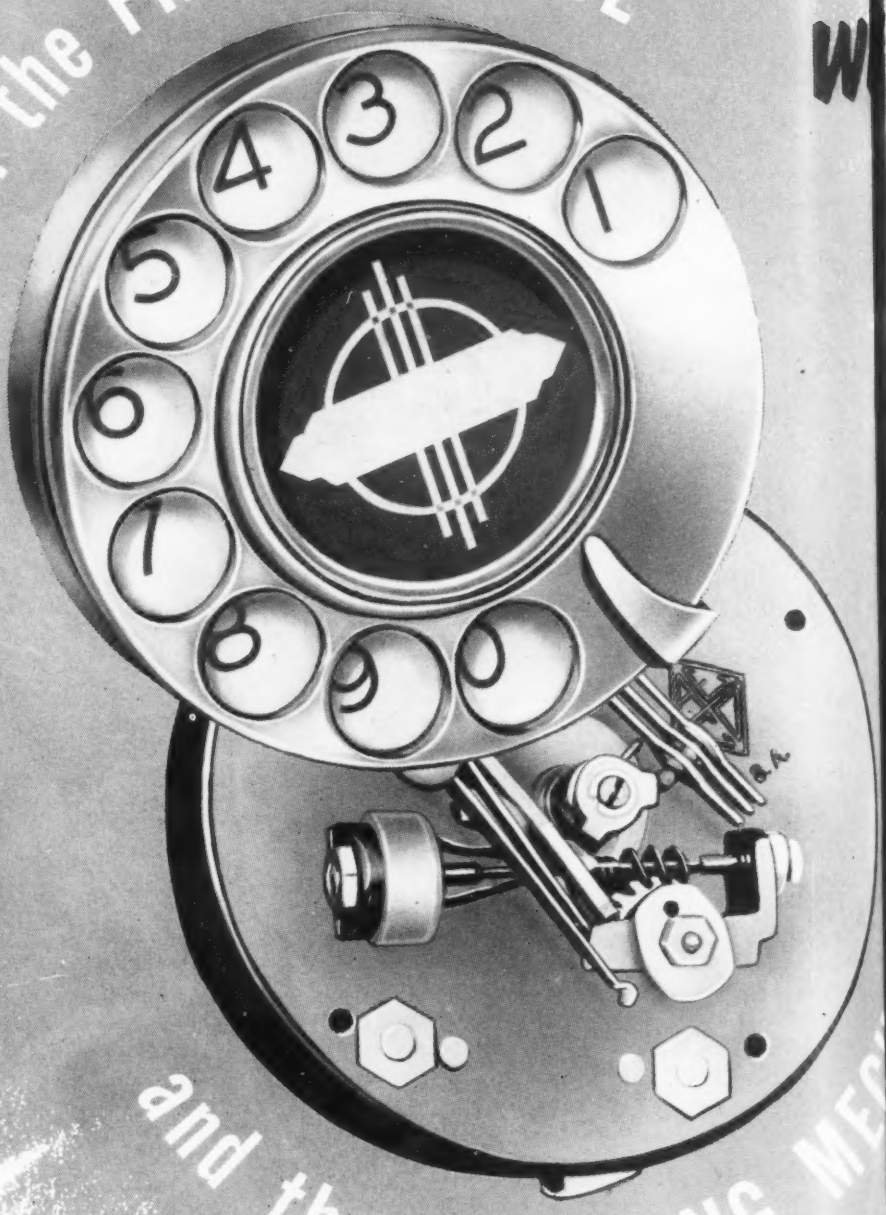

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a line all the master stations are automatically cut off. However, other substations still have access to the line.

(To be continued)

In the Nation's Capital

(Concluded from page 14)

opinion that it would not put the company in any better earning position. It might even result in a greater deficit. The commission suggested alternative proposals, such as zone fares.

The court held, however, that the company was entitled to an opportunity to increase its earnings (through a rate increase) and that under such circumstances the commission's refusal was confiscatory. The court's opinion stated: "A blood transfusion can hardly be refused solely because in the end the patient may die of an incurable disease. . . . We may assume that the company is not obsessed with suicidal tendencies, but on the contrary is trying desperately to survive."

And while on this subject of regulatory rate decisions, which uphold managerial discretion, we should not overlook an important ruling, handed down last week by the Wisconsin Public Service Commission. This decision granted a $535,000 rate increase to the Commonwealth Telephone Co. (an Independent company which is part of the General Telephone System). Some question was raised in the case as to the company's practice of fixing rates on a system-wide basis. The question is not exactly new. The Wisconsin commission has had to deal with it before. The New York commission recently took some notice of it, in pending proceedings involving the New York Telephone Co.

The objection to system-wide rate making usually comes from municipal officials, or others, who think rates ought to be fixed on an exchange basis. In other words, the investment and expenses of each telephone exchange would have to be figured out, with relation to the revenues received, in order to determine the rates for each particular exchange. The Wisconsin commission said (after referring to an earlier decision of last June) in the case of the North-West Telephone Co.:

"This (telephone) utility does not conduct its business as a separate corporation at each exchange. Investors and others, including both federal and state tax authorities deal with it as a single company. Expenses incurred, including taxes and earnings necessary to attract capital, are computed upon an actual single corporate enterprise and not a theoretical federation of small exchange companies. Hence, this precludes the exact ascertainment of many general expenses, taxes and required earnings for each exchange. It necessitates the apportionment by some equitable method albeit not an exact one nor one unreasonably or disproportionately expensive. Thus the paramount determinant for devising a rate structure for services rendered at each exchange, or regional group of exchanges, should be costs, but which includes a fair recompense to the investor for use of his funds."

"Although a utility should not be permitted to secure excessive profits at one exchange to make up deficiencies at exchanges which cannot produce a reasonable profit at salable rates, some deviation of earnings within a reasonable range or short of excessive profits will inevitably occur.

"But no practical method of either devising a rate structure or of apportioning costs will bring the levels of individual exchange earnings into perfect alignment."

Senate Bell-Labor Hearings

An investigation of labor relations in the Bell System — American Telephone & Telegraph Co. and its associated companies—began last week with presentation of testimony by the CIO Communications Workers of America before a sub-committee of the Senate Labor Committee. The inquiry has to do with over-all labor relations in the Bell System to determine whether present company structure and practices tend to create a favorable atmosphere for collective bargaining. Five days were assigned the CWA for presentation of testimony. AT&T management will have another five days, starting Aug. 28.

Joseph A. Beirne, CWA president, started his side with a claim that all 21 of the associated companies in the Bell network are dominated or owned by the American Telephone & Telegraph Co. The control includes labor relations policy, Mr. Beirne testified. In other words, he contended that the Bell System is actually operated on an industry-wide basis and that eventually the union wants to bargain with AT&T on that basis. CWA collective bargaining has been limited to the associated companies in recent years, following a nation-wide strike in 1947.

Jess Bell, Bell System spokesman, said if individual companies are singled out, their presidents will appear. The union said its case will cover the entire history of labor relations with the AT&T.

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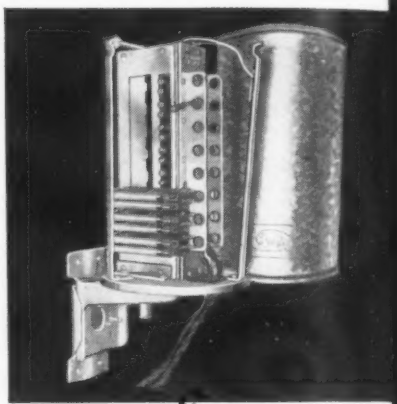

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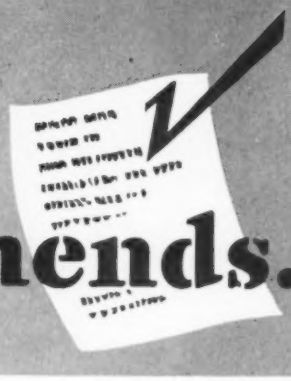
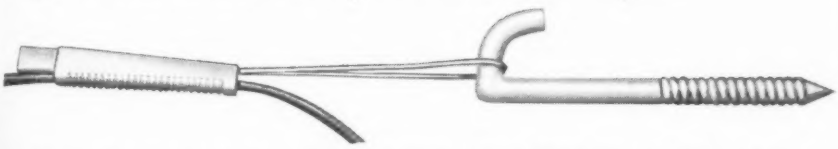


reliable *drop wire clamps*



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TYPE "P"—for No. 17 parallel reinforced. Holds drop wires at moderate tensions, but concentrates pressure on small area under heavy loads.

TYPE "PS"—for No. 17 and 18. Particularly for smaller, weaker wires. Even under breaking loads the "PS" supports drop without damage.

Reliable Drop Wire Clamps are unique in that they:

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3. Automatically tighten under load, assuring a firm grip without damaging insulation.
4. Eliminate sharp bends in wire.

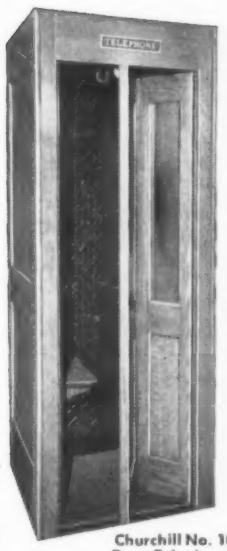
"Reliable identifies the quality"

for rural lines with fog, rain, humidity— hemingray insulators

(Left): Hemingray "No. 9." Made from only 9 oz. of glass, but with a maximum leakage path approaching standard long-distance design. Inner skirt surface well protected from rain-splash; long skirt protects pin itself.

(Right): Hemingray "No. 14." Its double-petticoat feature is useful wherever fog and humidity prevail. Production economy in design and lightness make its low cost attractive for rural telephone line budgets.

Manufactured by American Structural Products Company



Churchill No. 100 Folding Door Telephone Booth

The churchill telephone booth

. . . reduces overhead by increasing revenue

Users appreciate the comfort and quiet privacy afforded by the Churchill No. 100 Folding Door Telephone Booth. Operating companies enjoy increased pay station business.

Constructed as a single unit and equipped with a reinforced back panel for mounting a wall telephone or coin collector. Included as standard equipment are electric light and automatic electric ventilator.

Available in two finishes:

No. 100-A: Selected white oak, in light medium oak satin finish.

No. 100-B: Birch, mahogany finish.

Overall height, 84¾"; width, 30½"; depth, 30½". Shipped knocked down and crated.

Illustrated literature available.

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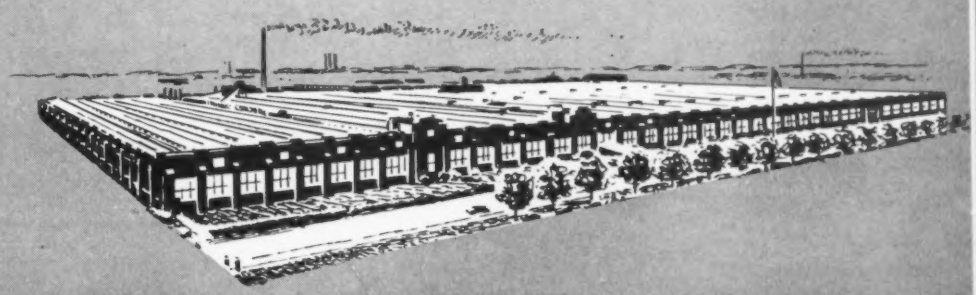

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Courts and Commissions

De Soto, Missouri, Exchange Receives $13,000 Increase

The Missouri Public Service Commission has granted the De Soto Telephone Exchange a total increase in rates of $13,000.

The commission's action followed a public hearing July 12. The company requested a total rate boost of $14,000 to provide for expansion and improvement of equipment and to give 5.72 per cent return on the total plant investment of $129,000.

The new monthly rates are:

Business: One-party, $4.75; two-party, $4.50; four-party, $4.00; 10-party, common battery rural, $3.50; multi-party, magneto rural, $2.75.

Residence: One-party, $3.00; two-party, $2.50; four-party, $2.25; residence extension, $1.00; 10-party common battery rural, $2.50; multi-party, magneto rural, $2.00; multi-party magneto rural switching lines owned by subscribers, 75 cents.

Discounts applying to above rates are 25 cents a month for wall or desk equipment.

V V

Indiana Associated Buys Two Companies, Issues Stock

The Indiana Associated Telephone Corp., Lafayette, was given authority by the Indiana Public Service Commission to acquire the property and assets of the Northern Indiana Telephone Co. and the Commonwealth Telephone Corp., Lafayette, recently.

Indiana Associated was also given authority to issue and sell $400,000 of first mortgage 3 per cent bonds, 7,500 shares of no par value common stock, and to borrow $150,000 from General Telephone Corp.

V V

Commonwealth Telephone Co. Granted Rate Increase

The Commonwealth Telephone Co., Madison, was recently granted rate increases by the Wisconsin Public Service Commission estimated to add in excess of $535,000 to the company's annual revenues.

The rates for local service become effective Aug. 27, and will add $510,000 in annual revenues, based on telephones in service. The rates were calculated to result in a return of 5.97 per cent on the rate base. The commis-

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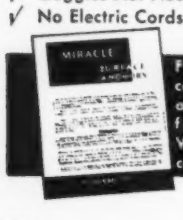
- ✓ No Noise
- ✓ No Inconvenience to Occupants
- ✓ Saves Labor and Tool Expense



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sion also approved intrastate toll rates, effective Sept. 30, estimated to add more than $25,000 to the company's revenue.

V V

Six Rate Orders Issued By Indiana Commission

Six orders dealing with rates were issued by the Indiana Public Service Commission recently. The Monroe County Telephone Co., Ellettsville, was granted temporary monthly rates as follows:

	Business	*Residence*
One-party line	$3.25	$2.75
Two-party line	3.00	2.25
Multi-party line	2.50	2.00
Multi-party line, rural	...	2.25

Temporary monthly rates approved for the Hoadley Telephone Co. are:

	Business	*Residence*
One-party line	$3.50	$2.85
Two-party line	3.25	2.25
Multi-party line	2.75	2.00
Multi-party line, rural	...	2.00

The United Telephone Co., Warsaw, was authorized a permanent increase which will produce $355,000 annual revenue; an emergency raise had been granted the company Dec. 29, 1949. It was also given authority to borrow $100,000 and to issue and sell 8,000 shares of its $50 par value common stock.

Monthly rates authorized for the Wallace Co-op Telephone Co. are: business, $3.00; one-party, $2.50, and multi-party, $2.00. The New Paris Mutual Telephone Co. received permission to charge $3.00 for one-party line service and $2.00 per month for multi-party. Monthly rates approved for the Union Telephone Co., Riley, are: one-party, $3.00; business, $2.50, and residence, $2.00.

V V

Ordered to Improve Property

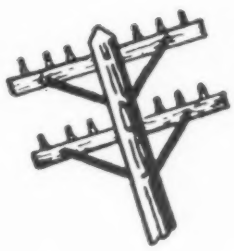
The Greene County Telephone Corp., Lyons, has been ordered by the Indiana Public Service Commission to improve its property. The work is to be completed within 60 days and progress reports are to be filed by the company.

V V

Organizes New Corporation

Acting on a joint petition of the Indiana Midland Telephone Corp., Roachdale, and W. W. Thomas, the Indiana Public Service Commission recently authorized Mr. Thomas to organize a corporation to be called the Thomas Telephone Exchanges, and to operate the Roachdale, Bainbridge and

Poles and Crossarms



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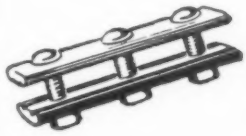

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17/2 Bronze, Twisted Pair, Neoprene Jacket.
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22/1 Copper, Mica Braid, Single Conductor.
1000 Ft. $4.80

22/2 Copper, Twisted Pair, Mica Braid.
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22/3 Copper, Twisted Triple, Mica Braid.
1000 Ft. ..... $12.75 3000 Ft. $36.00

— INTERIOR WIRE —

22/2 Twisted Pair, Brown Plastic, Coded.
1000 Ft. ..... $8.25 3000 Ft. $22.26

22/3 Twisted Triple, Brown Plastic, Coded.
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V V

To Establish New Exchange

Authorization to establish and construct a telephone exchange at Columbus, N. C., has been granted to the Thermal Belt Telephone Co., Tryon, by the North Carolina Public Utilities Commission with permission to charge the following rates:

	Residence	*Business*
One-party	$5.75	$3.85
Two-party	5.00	3.25
Four-party	4.50	2.60
Rural multi-party	3.50	2.50

V V

Illinois Company Will Use Increase to Improve Lines

The Illinois Commerce Commission Aug. 2 approved increased telephone rates for the Crossville Telephone Co.

The commission authorized the company to make effective the following annual rates: one-party business, $36; two-party business, $30; rural multi-party business, $30; one-party residence, $30; two-party residence, $27; four-party residence, $24, and rural multi-party residence, $24.

The order requires the company to use the major portion of the increase to rehabilitate and metallize its lines.

Increased wages are to go into effect along with the rate increase. The rate increases are effective as of Aug. 1.

V V

Firm Sues Southern Bell for Alleged Directory Omission

A Miami, Fla., chicken hatchery has sued the Southern Bell Telephone Co. for $150,021 damages in circuit court for allegedly omitting its name from the telephone directory.

Tropical Hatcheries, Inc., declared in the suit filed Aug. 4 that most of its business—exporting baby chicks to South America—has come through advertising in the classified section of the directory.

Failure to get it, the suit contends, has cost the hatchery "large sums of money" and brought "extreme setbacks in its export business."

The suit says the hatchery president, W. A. Albrecht, ordered directory advertising for the July, 1949, issue of the directory and got it, but that following directories omitted the hatchery from both the classified and alphabetical listings.

V V

Minnesota Companies Sold

Sale of the Grey Eagle Rural Telephone Co. to the Red Oak Rural Tele-

phone Co. and of the Daly Line Telephone Co. to the Blue Earth Valley Telephone Co. has been authorized by the Minnesota Railroad & Warehouse Commission.

V V

N. J. Utility Anti-Strike Law Upheld by Appellate Court

Constitutionality of New Jersey's public utility anti-strike law, providing for compulsory arbitration of labor disputes in public utilities where other settlement efforts fail, was upheld by the Appellate Division of the State Superior Court in an opinion Aug. 8 affirming an arbitrated wage increase for New Jersey Bell Telephone Co. operators (TELEPHONY, May 6, p. 28).

In attacking the law's constitutionality, the telephone company had contended it failed to set up strict standards prescribing what evidence arbitration boards might consider.

The court, however, termed the standards "definite and adequate." In an opinion delivered by Judge John B. McGeehan, the court said the standards "establish a definite and certain policy and rule of action for the guidance of the agency created to administer the law."

The standards were incorporated in the law by the New Jersey Legislature last year after the State Supreme Court had ruled that the absence of standards in the former statute rendered it invalid. The State Supreme Court held at that time, however, that the state was justified in having a law to protect the public from interruption of vital services.

The telephone company announced it would immediately appeal to the State Supreme Court from the ruling by the Appellate Division of the Superior Court. This will lead to a ruling by the state's highest tribunal as to the validity of the utility anti-strike law as amended by the 1949 legislature.

In refusing to change the arbitration board's order for a $2.50 weekly wage increase to the company's 11,000 operators, the Appellate Division opinion pointed out that "there was substantial evidence to support these awards." The company had attacked the increase as "unjust, unreasonable and not supported by the evidence."

The arbitration board, which granted the wage boost, was named by Gov. Alfred E. Driscoll after he ordered state seizure of the company's facilities last Mar. 1 to prevent an operators' strike. Such action is authorized by the utility anti-strike law (TELEPHONY Mar. 11, p. 23).

Following the arbitration board's award in April, the company asked

PROTECT YOUR CUSTOMERS

As well as your Company when doing Line Clearance work.

LINE clearance should be done without ruthless abandon and lack of concern for unnecessary destruction. Trees which form a beautiful home setting do not have to be hacked indiscriminately. Your customer gains, and you gain good will, thereby increasing good public relations.

IT'S so easy to avoid trouble; make sure your work is done by men who appreciate *the beauty and value of trees, and who* know how *to clear lines without destroying beauty. The Bartlett Way protects you and your customers. Call our local office today.*

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for a $9,800,000 rate increase to meet the new wages. The New Jersey Public Utilities Commission postponed action on the request pending outcome of the company's appeal in the Superior Court. The commission announced that the Superior Court's opinion cleared the way for further hearings on rate increases asked by the company.

The court's only change in the arbitration award was to move the effective date of the wage increase from Apr. 16 to Apr. 20, this year. The court explained that the Apr. 16 date was invalid since it did not coincide either with the date the state took over the company under the anti-strike law or the time the union contract expired. The opinion said these were the only dates to which the law permitted awards to be retroactive.

In announcing its appeal to the State Supreme Court, the company emphasized that the Superior Court's refusal to set aside the arbitration award placed it in the position of being compelled to pay its employes a wage rate higher than that paid operators anywhere in the nation.

V V

Indiana Bell Acquires Property

The Indiana Bell Telephone Co. was authorized to buy and the Mt. Summit Rural Telephone Co. to sell portions of the latter's telephone plant in recent action of the Indiana Public Service Commission. After the property is improved, rates at the New Castle exchange were ordered effective in the Mt. Summit area.

V V

Missouri Official Pleads For Denial of Pioneer Appeal

Denial by the United States Supreme Court of an appeal in which Pioneer News Service of St. Louis is attempting to retain telephone service it uses to supply racing information to St. Louis area bookmakers, was urged in a brief sent to the court Aug. 8 by Missouri Attorney General J. E. Taylor.

Mr. Taylor, in asking the court to refuse to take jurisdiction of Pioneer's pending application for review of an adverse decision of the Missouri Supreme Court, declared the appeal involved no valid federal constitutional question giving the higher court jurisdiction to review the case.

Pioneer Service, St. Louis outlet for the Chicago Capone racing news syndicate, asked the United States Supreme Court to set aside a Missouri Supreme Court ruling last Feb. 13, holding Circuit Judge James F. Nangle of St. Louis had no power to issue or enforce an injunction granted in April, 1949, compelling Southwestern Bell Telephone to restore 19 telephones to Pioneer. (TELEPHONY, Mar. 25, p. 27.)

Those telephones had been disconnected in February, 1947, on instructions from Gov. Phil M. Donnelly and Attorney General Taylor. The officials ordered the telephones cut off on the ground they were being used as a means of violating state laws relating to bookmaking.

The state supreme court also ruled that initial jurisdiction of matters of telephone service was in the Missouri Public Service Commission and not in the courts, in holding invalid Judge Nangle's order.

The Attorney General, in arguing Pioneer's petition for review presented no proper federal question, attacked a contention that the state supreme court decision deprived the organization of property without due process of law, and of equal protection of the laws in violation of the Fourteenth Amendment to the United States Constitution.

V V

SW Bell Temporary Increase Now Permanent in Arkansas

A raise in telephone rates, made permanent Aug. 7 by the Arkansas Public Service Commission, will net Southwestern Bell Telephone Co. an annual income increase of $1,167,131 for total operations and $1,304,379 for intrastate operations.

The raise was granted on a temporary basis in September, 1946. The gross annual increase in rates is $1,929,000.

V V

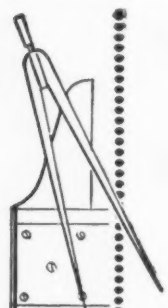
$3,500,000 Rate Raise for SW Bell Final in Missouri

The $3,500,000-a-year rate increase granted to Southwestern Bell Telephone Co. by the Missouri Public Service Commission last June 17 became final Aug. 9. (TELEPHONY, July 1, p. 25.)

Motions for rehearings of the case, filed by St. Louis County, Kansas City, and Trenton, Mo., had been denied July 9 and these opponents had 30 days to appeal to Cole County circuit court. No appeals were filed.

Meanwhile, the company filed a motion in circuit court at Jefferson City, seeking return of $4,200,000 in impounded funds, which had been paid into court at the rate of $300,000 a month, pending settlement of an appeal from an earlier $3,400,000-a-year rate increase.

In seeking a return of the money the company pointed out that Circuit



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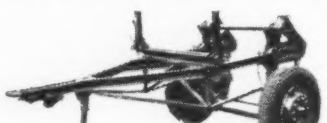

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P8T Series All Purpose Trailer: Combination cargo and pole trailer — new in design — versatile — many practical advantages. Front and rear bolsters, extension tongue, removable fenders and side boards, roomy cargo space.

1485-A Pole Trailer: Tubular-type tongue construction for strength with light weight. Rear bunk balances trailer and provides easy handling, when empty.

M Series Pole Trailer: 3 to 5 tons, exceptionally rugged. Heavy duty bearings permit dual tires. Extension tongue. Maximum safety, dependability, flexibility.

These trailers are representative of the wide line offered by FWD-Eagle — equipment engineered by and for utility men expressly for their needs.

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EAGLE MANUFACTURING CO.
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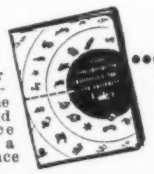
Write today for the complete catalog of FWD Line Construction and Maintenance Equipment — a useful reference book.



Judge Sam C. Blair's order reversing the rate increase had been suspended permanently by the Missouri Supreme Court and that "the impounding had served its purpose."

V V

Nebraska Voters Veto Plan For County Telephone System

Voters of Saunders County, Neb., by a vote of 2,573 to 854, turned down a proposal submitted at the August primary election which would have put the county into the telephone business by authorizing the county board to levy and collect a tax of two-fifths of a mill on each dollar of valuation.

The petitions for submission were circulated by representatives of farm organizations, and when filed contained about 200 more names than the number of votes cast in its favor at the election. The personal compaign for the proposal was backed up by two page advertisements in county weeklies, the main argument being that a county system could be operated on a lower schedule of rates than those now in effect and could provide county-wide free service.

Saunders County is the home of Walter F. Roberts, a member of the Nebraska Railway Commission, who took an active part earlier in the campaign when petitions were in circulation.

The law permitting organization and operation of county telephone systems was enacted 37 years ago, but only a few attempts have been made to utilize it. Saunders was the sixth county to vote down county ownership, the others being Stanton, Clay, York, Howard, and Antelope.

V V

Kansas Company Gets Increase; Schedules Improvements

Rate increases, effective Aug. 1, were recently granted to the Suburban Telephone Co., Tonganoxie, Kan., by the Kansas Corporation Commission to enable the company to make improvements.

Work has been started on a $25,000 improvement program at the company's Basehor exchange.

Improvements consist of metallizing the Basehor exchange, installing aerial cable in the town and enlarging the existing switchboard.

According to Foster Laming, manager of the company, the Tonganoxie exchange is scheduled for $15,000 worth of improvements as soon as the work at Basehor is completed.

During the past four years the company has spent $22,000 in improvements in Tonganoxie and the surrounding area.

Hears Complaints Against N. C. Company's Service and Charges

The North Carolina Utilities Commission held a hearing Aug. 9 to hear complaints by Lewisville residents against the Old Town Telephone System, Winston-Salem, N. C.

Lewisville subscribers contend that toll charges on calls to Winston-Salem are too high and that service is generally unsatisfactory. They added that J. Lee Keiger, owner, promised them toll-free service more than 10 years ago in exchange for rights-of-way, but that tolls now have been imposed.

Mr. Keiger maintained that tolls in the Old Town area are no higher than those charged elsewhere in the system, and also that the company's request for a flat rate increase of $1.00 a month is justified. He said the company is operating at a financial loss and must increase its revenues to operate as a sound business venture.

V. L. Choate, director of accounting for the commission, said the company has lost $13,385.56 since it began operations July 30, 1936, and that its investment during the 14-year period to June 30, 1950, had been $122,838.84. He said it had done a good job of maintaining its rural telephone system.

During the 12-month period ending

(Please turn to page 39)

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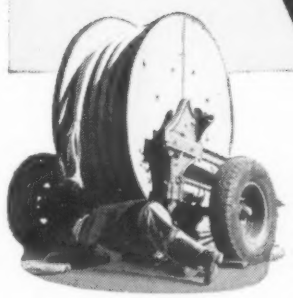
Complete Outside CONSTRUCTION, ENGINEERING and MAINTENANCE



Whatever your problem . . . wherever it may be . . . we can help you plan, erect, repair or maintain your outside telephone plant.

Years of on-the-job experience working with independent telephone companies from coast-to-coast, the finest and most modern equipment, PLUS the know-how of trained and experienced crews assure you efficient, economical, long-lasting service.

Our engineers have the background and practical experience to help you plan and engineer your job and to assist you in obtaining critical materials.

All work is done to A T & T specifications or equivalent unless otherwise requested.

So, why not put this experience and skill to work for you—call us today! Let us give you time and cost estimates on construction, maintenance or repair jobs. No obligation! Do it today!

NEALE CONSTRUCTION CO.
ENGINEERING • CONSTRUCTION • MAINTENANCE
TOPEKA, KANSAS PHONE 4-2621

THE PLANT MAN'S *note book*

WE NOTICE that gadgets for use on telephones are not as numerous now as they were formerly. This proves our often mentioned contention that worthless gadgets, if ignored, will soon disappear since they are only a passing fancy.

The colored telephone shell is not seen as frequently now as during the past months, however, the small rubber attachment which holds a handset on the shoulder in order that both hands may be free while telephoning continues in use. In our opinion, this indicates a definite need for such a device and it seems a pity that someone doesn't develop a convenient and practical handset shoulder bracket.

• • •

It has been said: "Economy is the way of spending money without getting any fun out of it."

• • •

Television is the most amazingly efficient distraction man has ever produced. And we don't have a television set either!

• • •

Someone has said that if you're in the right, argue like a man. And if you're in the wrong, like a woman.

• • •

We have heard complaints of late to the effect that telephone cable has been received from the supplier on reels of a width that could not be carried on the available cable handling equipment. It is believed that this may be because of the fact that telephone cable in some cases has been shipped on reels commonly used for power cables.

It appears highly desirable that some action be taken to standardize reels for use in the telephone industry.

• • •

We are in receipt of a letter from G. W. Channell, of the Channell Splicing Machine Co. in San Marino, Calif., in which he comments on an item which appeared on this page in the June 24, 1950 issue. The subject item mentioned the fact that a splicer and his helper completed a straight splice in a 1212 pair 24-gauge cable in 24 hours. He states in part:

"This is very good time for hand splicing and it would not be fair to compare it to machine splicing, for the same splicer with a machine could make the same splice in less than 12 hours."

Mr. Channell goes on to state that one splicer set-up, boiled, spliced and wiped a 1212 pair cable in eight hours and five minutes. An apprentice splicer averaged 11 hours and 47 minutes on seven splices in 1212 pair cable.

This is certainly good splicing time, we must all agree.

• • •

Americans burn enough timber in the form of matches every year to build 25 six-room houses.

• • •

It is noted that the use of outdoor public telephones is definitely on the increase. These telephones are located on bus, subway and railway station platforms as well as various other convenient locations.

Outdoor type booths are frequently provided which make these telephones more useful. These booths prove ideal for use near filling stations. It is believed that at some time in the future practically all filling stations will be provided with a public telephone installed in an outside booth.

• • •

The writer recently examined two telephone dials that indicated clearly the difference between good and bad equipment. The one dial had been in service over 10 years with only a few minor cases of trouble and very few parts replacements. This old dial is giving good service and no doubt will continue to do so for many years to come.

The other dial, with less than two years in service has caused continuous trouble and is worn to such an extent that repair at this time is not considered justified.

The good dial was fabricated by an established manufacturer of telephone equipment. The inferior article is the product of a newcomer in the communications field who attempted to copy conventional dials. This short time has proved that neither workmanship nor materials were duplicated.

The above incident proves conclusivly, in the writer's mind, that there is no substitute for experience.

• • •

It now appears that the new two-man construction truck has a lot of advantages to offer for the small telephone company. This is a one-ton chassis, with four-wheel drive, equipped with balloon tires that can travel to almost any location in practically any type of terrain.

A light T-type derrick is mounted on the front bumper the height of which is controlled by a small winch located in the body of the truck. Poles up to 30 ft. can be set with this derrick. Another winch located in front of the radiator lifts the load to be handled by the derrick. A power-driven earth auger can be suspended from the derrick.

Power take-up reels can be placed on either end of the front winch. A 110-volt generator is operated from the truck motor which may be used to operate labor saving tools such as wood augers, saws, and masonry drills.

Two qualified men with one of these well equipped trucks can do the work of an entire crew, not adequately equipped, and with complete safety.

• • •

With the numerous improvements in adhesives during the past few years, we would not be surprised if, in the near future, it will be possible to attach wire and cable runs to inside walls without the use of cleats or tacks of any kind. A small amount of adhesive at regular intervals will hold the wire or cable firmly in place.

A PROGRESS REPORT

LABORATORY REPORT
KENTON LABORATORY

To: Mr. R. K. McBerty, President
From: Mr. J. M. Blackhall.
Subject: Summary of life test on McBerty Automatic Switchboard, Model MCX-100

This is a further report on the performance of the above switchboard which was put under continuous life test on November 10, 1948 and which has continued under test and observation since the issuance of the previous yearly summary, dated July 5, 1949.

This improved switchboard was built in 1948. Principle among the changes from earlier designs are the use of phenolic moldings and a greatly increased application of contact protection.

5,803,002 completed calls have been made to date - the equivalent of 22.9 years of normal heavy service for this size switchboard. Artificial line loops with mechanical dialling, ringing and answer supervision simulate actual field service as closely as possible.

A total of 8 cases of trouble, each requiring a service call, have been recorded during the past year of continuous life test which represents 14 years of field service. These 8 cases, together with 8 cases of trouble found during the first 9 years of field service, are listed below.

a) - 2 shorts in switchboard wiring.
b) - 5 relay armatures grounded to frame.
c) - 1 relay coil with shorted turns.
d) - 1 broken weld.
e) - 2 make contacts welded on F relays.
f) - 1 make contact welded on MB relay.
g) - 1 make contact failure due to foreign material.
h) - 1 shorted contact.
i) - 1 break contact failure.
j) - 1 broken fuse - cause unknown.

At present this switchboard shows evidence of its 23 years of use only by wear of a small percentage of the busiest contacts and while it can be restored to approximately half-life condition by replacement of a few guarding, dialling, ringing and releasing relays, it is recommended that it be run unchanged until it fails to give a commercial grade of service.

21 July 1950
JMB:bb

ORY REPORT
ABORATORY

To: Mr. R. K. McBerty, President
From: J. M. Blackhall, Kenton Laboratory
Subject: Summary of life test on McBerty Automatic Switchboard, Model MCX-100

The subject switchboard was shown at the National Convention in Chicago, October 15, 1948. It was returned to the laboratory where it has been on continuous life test.

2,286,970 completed calls have been made to date - the equivalent of 9 years of normal heavy service for this size switchboard. Artificial line loops with mechanical dialing and supervision simulate actual field service as nearly as possible.

Eight cases of trouble requiring service have been recorded.

a) - 2 shorts in switchboard wiring.
b) - 1 relay armature grounded to frame.
c) - 1 relay coil with shorted turns.
d) - 1 broken weld on switchboard wiring.
e) - 2 make contacts welded on F relays.
f) - 1 make contact failure due to foreign material under armature.

The switchboard shows little evidence of wear. The test will continue with close observation and detailed daily reports. All detailed information is available upon request.

July 5, 1949

from the
NORTH
LABORATORIES

THE NORTH ELECTRIC MANUFACTURING CO., Galion, Ohio, U. S. A.

Originators of ALL RELAY *Systems of Automatic Switching*

PLANT MAN'S QUIZ

Q. What type of ringer is recommended for use in rural line telephones?

A. This will depend primarily upon the ringing system used on a particular line.

The ringers may be broadly classified with respect to their mechanical construction. Basically, one type will differ from the other in the design of its armature and its principle of operation. In the harmonic ringer, the armature is held in a central position by a rigidly mounted reed. Its armature-clapper assembly is mechanically tuned to a single ringing frequency by an appropriate weight placed at the free end of the clapper stem. The straight line ringer has its armature assembly mounted by a hinge arrangement so that it is only crudely tuned and responds to a broad range of frequencies and voltage. The biased ringer is similar to the straight line ringer, but, in addition, it is equipped with a tension device which rejects direct current pulses of one polarity, and operates on DC impulses in the other polarity.

• • •

Q. What is the telephone type crash alarm system commonly used at airports?

A. A telephone type crash alarm system is essentially a conference call group. The equipment used to provide this feature consists principally of a signal lamp cabinet with a separate terminal box, associated relay rack and a manual telephone set for each cabinet.

This arrangement makes it possible for one originating station to call a maximum of 20 stations simultaneously. A central office may have one or more of these special call groups, as required. This special equipment may be used for fire reporting, where several members of a volunteer fire department may be quickly called, alerting of guards, or other specific applications where a number of special or regular telephones must be called quickly in an emergency.

• • •

Q. Why are the cases of combination desk type telephones made from plastic instead of metal? It would seem that even though the metal sets cost more, they would be worth the difference since breakage would be eliminated.

A. Ordinarily, the cases or inclosures for handset type telephones are constructed either of moulded plastic or die cast metal. We are advised by one manufacturer that there is very little difference in the cost.

When moulded plastic is used, inserts must be moulded in place to hold the various parts to the case.

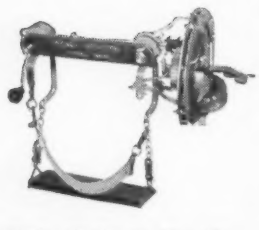
In the use of the die cast case, the metal may be machined to anchor the various parts. On the other hand, the die cast case must be painted to provide the proper finish while the moulded plastic has a smooth, polished surface without any special treatment.

In general, it is believed that users prefer the moulded plastic to the die cast case. Breakage of telephone cases in the average exchange is slight and we doubt that the metal case will ever come into general use in this country.

It appears that the hanging handset will become increasingly popular for residential use and breakage on this type of telephone will be practically nil.

On the job records prove that the Neale Model D Pull-type Cable Spinner speeds new work, keeps line charges low.
Cut Maintenance Costs—
Speed New Construction

Cable spinning lengthens plant life . . . lowers maintenance costs 2/3 . . . speeds new construction, telephone companies from coast to coast report. You, too, will find cable spinning fast, practical and economical when your crews are equipped with Cable Spinning Equipment Company tools designed specifically for the job. There's a complete line to choose from. Ask your jobber today.



Neale Model B One Man Cable Spinner operates from ground or strand.

For BEST RESULTS . . .
Use NEALE Wire!

Available in 7 different types and sizes, famous Neale Spinning Wire meets the toughest construction and corrosion conditions.

CABLE SPINNING EQUIPMENT CO.
TOPEKA, KANSAS Phone 3-1829

Courts and Commissions

(Continued from page 35)

June 30, 1950, the company, Mr. Choate said, showed a 3.68 per cent return on its investment.

Mr. Keiger declared the company wanted to "give service, but in order to do this I must have more revenue." He said the company needs additional revenue of $8,654.92 per year, and that this can be raised by the proposed $1.00 a month levy plus tolls for the Old Town area.

V V

Appeals Court Grants Second Chance in Suit Against C&P

A Washington, D. C., man was given a second chance Aug. 7 to win his $50,000 suit against the Chesapeake & Potomac Telephone Co. for breach of contract.

E. Bradley Clay books bands for parties, meetings, and other functions during the evenings.

He claims that he was damaged when the company in 1947 reneged on its promise not to assign one of his two telephone numbers to anyone else when he canceled it, and when they failed to carry out a later promise to refer all his calls to a new number.

The end result of this was, he declares, that his customers no longer sought him out and his business was greatly damaged. However, his case was thrown out in district court and then taken to the United States Court of Appeals.

The appeals court said, in a two-to-one decision, that the trial court erred in throwing out the case. Under the facts presented, according to the reviewing court, the company "contracted to provide reference service . . . and subsequently breached such contract."

In his dissent, Judge E. Barrett Prettyman said that under its regulations, the company was absolved since it could not under the governing regulations, make such a contract.

V V

Rate Increase Gives Florida Company 7% Return

The Gulf Telephone Co., Perry, Fla., on Aug. 11 was granted a rate increase by the Florida Railroad & Public Utilities Commission. The commission stated that the company had been operating at a loss and estimated that the new rates would give it a return of

(Please turn to page 42)

WON'T WEATHER

Dirt-collecting pit holes won't form on Armstrong's Glass Insulators. They are made of highly inert glass unaffected by airborne chemicals.

Factory tested for load-bearing strength and resistance to extremes in temperature, Armstrong's Insulators give years of dependable service.

Get a sample Armstrong's Glass Insulator from your jobber or write for information and prices to Armstrong Cork Company, Glass and Closure Division, 295 Fifth Avenue, New York 16, N. Y. Available for export.

Armstrong's No. 1

ARMSTRONG'S GLASS INSULATORS

for communications . . . for power

Linemen Prefer

"BLACK BEAUTY" POLES

PRODUCT OF TEXAS CREOSOTING COMPANY

ALWAYS CLEAN and DRY

Add longer life to your pole lines with clean, dry "Black Beauty" poles. "Black Beauties" are cut from selected Southern yellow pines, pressure-treated with top-grade coal tar preservatives to make them longer lasting. Linemen prefer "Black Beauty" poles because they are always clean and dry.

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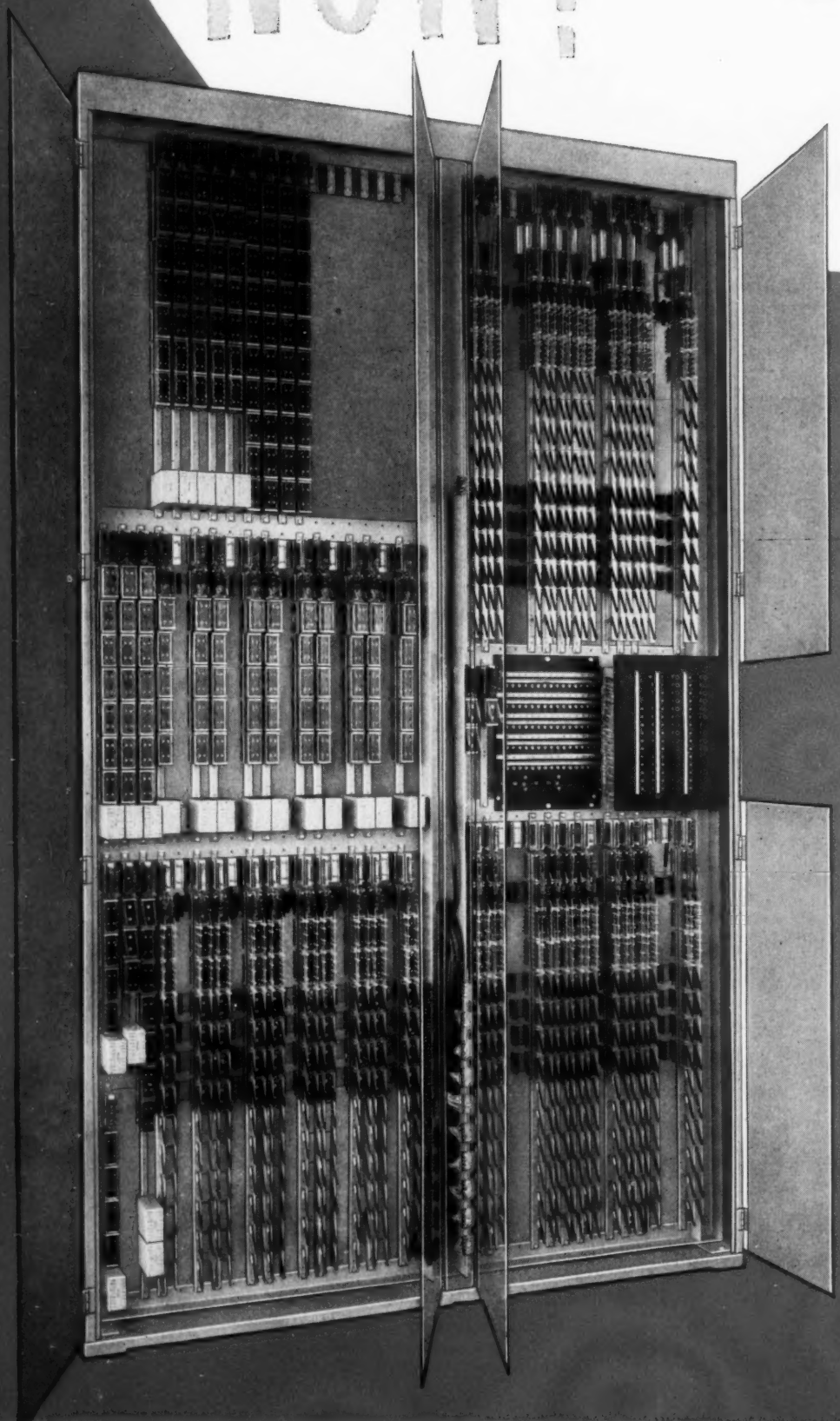
NOW!

Flexibility Unlimited

Announcing a



This is the dial switchboard you have been waiting for—"All-Relay" performance with undreamed of flexibility, the North MCXR.

•

"Position-then-Lock" Jack-mounted lines and links

Wedge locked, demountable, multiple

Common Control — more work from less equipment

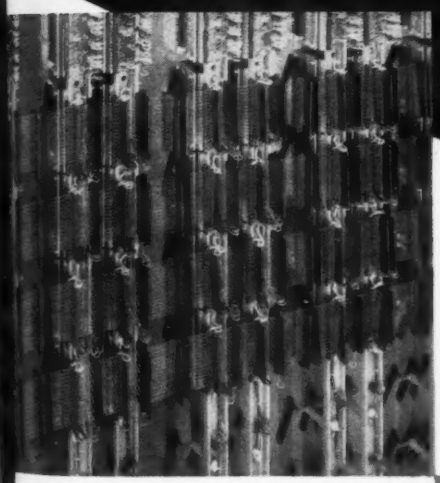
Lifetime contacts

•

Listed above are but a few of the outstanding features of this system. Full details and many more advantages are shown in our new brochure "Advanced Design MCXR," Bulletin SF—263. Write or send the attached coupon today.

in Your Dial Switchboard...

advanced design NORTH All-Relay MCXR



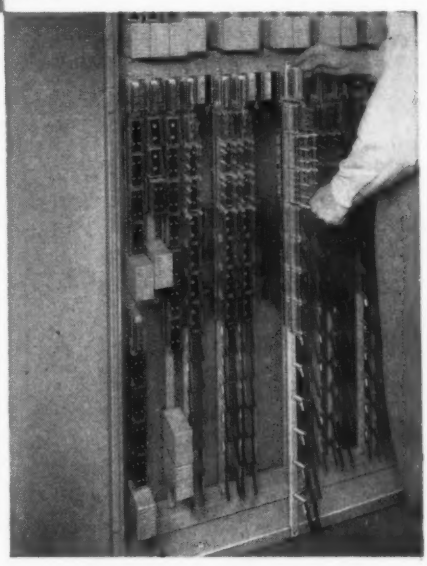
strip. This jack concentrates a large number of precious metal connections in a small space—provides high pressure and ample wiping action upon closure. Jack strip mounting makes greater space economy possible.

ALL NEW DEMOUNTABLE MULTIPLE

Two sliding bakelite wire guides for each relay are mounted on the multiple. When positioned, the guides, by wedge action, provide a high contact pressure between relay springs and corresponding multiple wire. Moving the wire guides to the center of the relay mounting strip frees the contact and allows the multiple to be removed easily from the switchboard.

ALL NEW JACK-MOUNTED STRIPS

In North MCXR, line and link relay strips have a multi-contact connection jack built into the top of each



NORTH ELECTRIC MFG. CO.
MCXR Division
Galion, Ohio, U.S.A.

☐ Yes, I want information on the North MCXR—send bulletin SF-263

☐ I need North MCXR—have your representative call with full details

Name _____ Title _____

Company _____

City _____ Zone _____ State _____

NORTH ELECTRIC MANUFACTURING COMPANY

ORIGINATORS OF ALL RELAY SYSTEMS OF AUTOMATIC SWITCHING

GALION, OHIO, U.S.A.

WHY PUT UP WITH THIS?

WHEN YOU CAN HAVE THIS...

THE NEW KOILED KORD

FOR ONLY 75c

Give your customers the finest, longest lasting, most convenient telephone cord without extra cost to them.

The new Koiled Kord uses tinsel conductors, rubber insulated to provide maximum flexibility and minimum pull. The jacket is neoprene to protect against moisture, grease, acids, oil, perspiration and other damaging materials. The neoprene jacket resists abrasion and the patented koil prevents kinking thereby eliminating two of the greatest enemies of old fashioned fabric cords.

Measuring only a little over 8 inches long, the new Koiled Kord has an O.D. of .195 inches and weighs less than 2¼ ounces. It has a pull of only 1 pound when extended to its full length of approximately four feet.

Koiled Kords available trimmed to fit all standard desk sets. Specify type when ordering through your Independent Telephone Supplier.

Koiled Kords
INCORPORATED

BOX K,
HAMDEN, CONNECTICUT

7 per cent on its investment, which it termed fair and reasonable under prevailing conditions and for a reasonable time in the future to maintain the company's credit.

Following are the new rates:

	1-Party	2-Party	4-Party
Business	$5.75	$5.00	$4.25
Residence	3.25	2.75	2.10

Rural 8-Party Service

Distance from Base Rate Area (Basic Rate $2.50)	*Add Per Month*
Less than 2 miles	None
2 to 4 miles	.25
4 to 7 miles	.50
7 to 10 miles	.75
10 to 13 miles	1.00
13 to 17 miles	1.25
17 miles and over	1.50

V V

Company Authorized to Operate Exchange at Columbus, N. C.

The North Carolina Utilities Commission on Aug. 8 authorized the Thermal Belt Telephone Co., Tryon, N. C., to operate an exchange in Columbus, county seat of Polk County, which now is served by multi-party lines from Tryon.

In its order, the commission found that there is both demand and need for the exchange, and the rate schedule effective at Tryon was approved tentatively, "subject to further investigation and revision." The rates range from $5.75 per month for private residence telephones to $2.50 for rural multi-party business telephones.

The commission estimated that within six months the new dial switchboard will be serving about 50 subscribers.

V V

Increased Rates Approved For Illinois Company

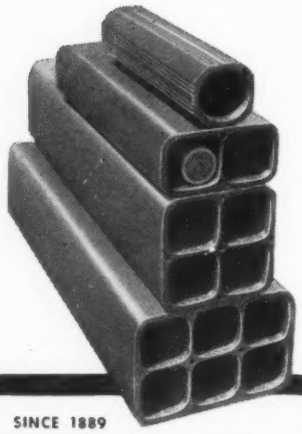
A new schedule of rates for the Port Byron Telephone Co. has been authorized by the Illinois Commerce Commission. The following annual rates for telephone service became effective Aug. 1:

Individual business, $39; two-party business, $36; rural multi-party business, $30; business extension, $12; individual residence, $33; two-party residence, $30; four-party residence, $27; rural multi-party residence, $27; and residence extension, $9.

V V

Issues Amended Order

An amended order granting a $4.00 monthly gross rate for rural business service was issued to the Rural Telephone Co. for its proposed Rogers exchange by the Minnesota Railroad & Warehouse Commission on Aug. 9. According to the commission, the original application quoted the rate at $3.75 in error.



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NATCO
CLAY CONDUIT

The proved and standard Protection for Underground Telephone Cables.

Cheapest in the long run. Highest quality and a full line of shapes.

National Fireproofing Corp.
327 FIFTH AVE.
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ELECTRIC SOLDERING TOOLS

PLUG TIP
All parts replaceable

50 Watts ¼" Tip Dia.
100 Watts ⅜" Tip Dia.
150 Watts ⅜" Tip Dia.
150 Watts ½" Tip Dia.
200 Watts ⅝" Tip Dia.
300 Watts ⅞" Tip Dia.

VULCAN
ELECTRIC COMPANY
DANVERS 20 MASS.
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DON'T BREAK YOUR NECK! PREVENT ACCIDENTS!
CUT LABOR COSTS 'to 50%
DOUBLE PRODUCTION! With the New, Amazing, LIGHTWEIGHT ALUMINUM Comb. Sawing, Pruning, Trimming, Fruit Picking, Shaking Poles.

Curved Type Tree Saw No. 1
AVOCADO PEAR, PEACH & APPLE PICKER
No 12
Fruit Picker No. 6
CUTS LIMBS
Hook No. 5
Block & Tackle Trimmer #7
Tree Saw No. 9
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SECTIONAL POLES 1/3 WT. OF WOODEN POLES

Combine Sections of Poles to make Poles up to 80 ft. tall. Weighs 1 lb. per 5 ft. 60c per ft. Attachments extra. F.O.B. Los Angeles. No Breakage. No Splinters. Lasts Forever. Sections from 2 to 30 ft. Reaches top of any tree. A 60 ft. pole weighs only 12 pounds. SEND FOR FREE CATALOG & FREE BOOKLET

HOW TO PRUNE FRUIT & SHADE TREES

TELLS YOU HOW TO INCREASE THE QUALITY and QUANTITY of Your FRUIT as Well as the BEAUTY OF YOUR TREES.

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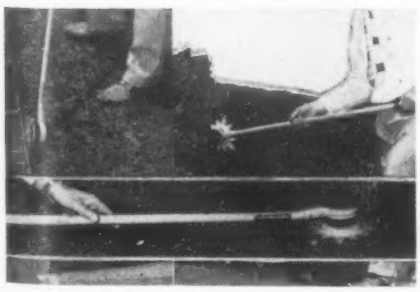
ELECTRIC LAWN EDGER AND HEDGE CLIPPER



Back-breaking work transformed into fun

Gardeners everywhere are hailing the new MAGIC WAND.

Extremely light. Cuts, trims, prunes hedges, lawns, flower beds, bushes. Ideal for work around rocks, fences, curbing, bricking, buildings, etc. Operates on 110 AC or DC voltage. No oiling or greasing. Rugged construction. Home-type model (3 lbs.), $17.95; professional model (5½ lbs.), $27.95. Fully guaranteed. Salesmen, dealers, jobbers wanted. Order direct from the manufacturer.

APEX LABORATORIES
P.O. Box 283-M.C., So. Pasadena, California

Five Illinois Independents Have New Rate Schedules

Five Independent companies were granted rate increases by the Illinois Commerce Commission recently. The companies and their rate schedules are:

Chandlerville Telephone Co.

Class of Service	*Net Annual Rates Present*	*Authorized*
Business		
Individual	$36.00	$45.00
Two-party	33.00	39.00
Rural multi-party	33.00	39.00
Residence		
Individual	27.00	36.00
Two-party	24.00	33.00
Four-party	24.00	30.00
Rural multi-party	27.00	30.00

Cornell Community Telephone Co.

Business		
Individual	$31.00	$39.00
Two-party	28.20	36.00
Rural multi-party	25.20	30.00
Residence		
Individual	28.20	36.00
Two-party	25.20	33.00
Four-party	25.20	30.00
Rural multi-party	25.20	30.00

Crossville Telephone Co.

Business		
Individual	$24.00	$36.00
Two-party	21.00	30.00
Rural multi-party	24.00	30.00
Residence		
Individual	24.00	30.00
Two-party	21.00	27.00
Four-party	21.00	24.00
Rural multi-party	21.00	24.00

LaMotte Cooperative Telephone Co.

Business		
Individual	$30.00	$42.00
Rural multi-party	30.00	39.00
Residence		
Individual	21.00	33.00
Four-party	18.00	27.00
Rural multi-party	18.00	27.00

Port Byron Telephone Co.

Business		
Individual	$27.00	$39.00
Two-party	24.00	36.00
Rural multi-party	18.00	30.00
Residence		
Individual	24.00	33.00
Two-party	21.00	30.00
Four-party	18.00	27.00
Rural multi-party	18.00	27.00

V V

Winners in Nebraska Primary

Chairman Harold A. Palmer of the Nebraska Railway Commission was renominated on the Republican ticket at the recent statewide primary election, defeating John Knickrehm, former commission member. J. C. McReynolds, Lincoln attorney, making a third try for commissioner, won the Democratic nomination.

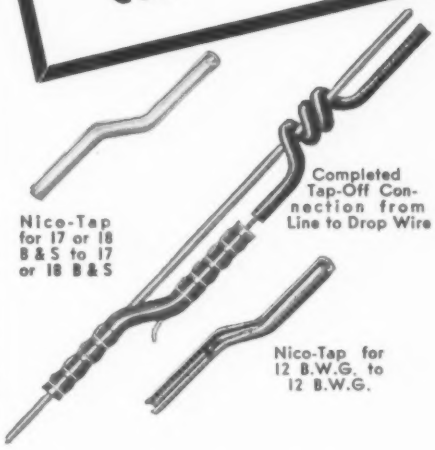
V V

Summary of Commission Rulings and Hearings

Illinois Commerce Commission

Aug. 14: Hearing regarding purchase and sale contract of Tri County

Nico-Tap
THE FAST, EASY WAY OF MAKING TAP-OFF CONNECTIONS



● Here's a new Nicopress Sleeve that materially increases efficiency in making tap-off connections.

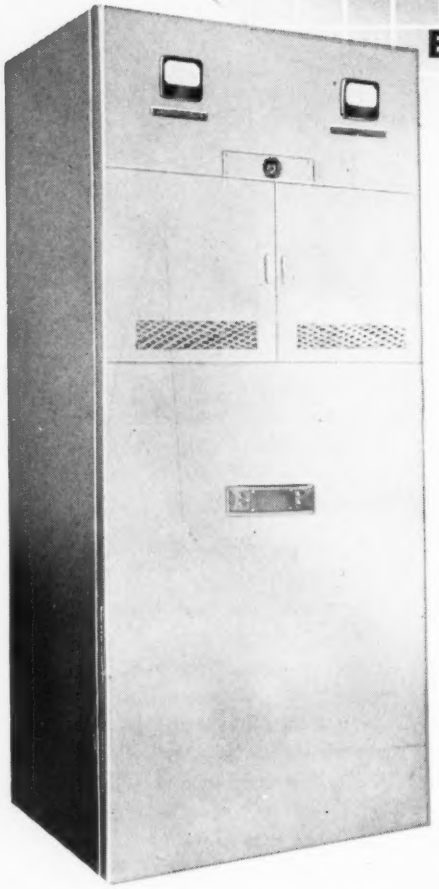
Nico-Taps meet every requirement for this type of work. Completed connections are strong, tight and efficient. And besides, Nico-Taps are real time savers. They are split, thus eliminating all need of cutting the line wire to make the connection. All you do is slip the sleeve over the wire and compress with your Nicopress Tool.

Nico-Taps are now available in three sizes; one for tap-offs from 17 or 18 B&S to 17 or 18 B&S (Stock No. T2-045B), one from 12 B.W.G. to 12 B.W.G. (Stock No. T2-109D), and one, a reducing sleeve, from 12 B.W.G. to 17 or 18 B&S (Stock No. T2-109x045D).

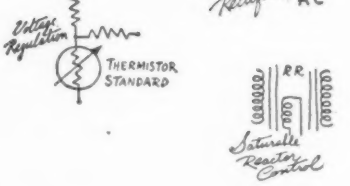
BUCKEYE
TELEPHONE & SUPPLY CO.
COLUMBUS, OHIO

HIGHER EFFICIENCY

OVER WIDE LOAD RANGE WITH PECO BATTERY CHARGERS



- New control circuits
- Reduced stand-by power consumption
- Accurately controlled



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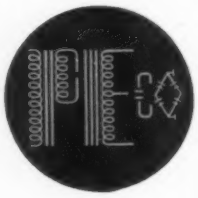

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Telephone Co., Creston, with Alpheus E. Shaffer.

Aug. 14: Hearings on complaints against service and equipment of Woodhull Village Telephone Co. and on complaint of Woodhull Union Switchboard Assoc. regarding the company's alleged lack of cooperation on mutual problems.

Indiana Public Service Commission

Recent rate increase petitions: Hymera Telephone Co., Lapel Telephone Co., Citizens Telephone Co., Fairmount, for its Fowlerton exchange; Morres Hill Telephone Co., Kirksville Telephone Co., Cutler Co-op Telephone Co., and Yeoman Telephone Co.

Kansas Corporation Commission

Sept. 1: Hearing on application of Fontana Telephone Co. and Elk Falls Telephone Exchange for authority to change rates.

Sept. 15: Hearings on applications of F&M Telephone Co., Ulysses, and of Richmond Home Telephone Co., for authority to change rates.

Sept. 25: Hearing on petition of Osage Telephone Co., Osage City, for authority to change rates.

Oklahoma Corporation Commission

Sept. 7: Continued hearing on application of certain residents of Noble, Okla., for rural service from the Southwestern Associated Telephone Co., Dallas, Tex.

Sept. 12: Continued hearing on complaint against the service of the Ardmore-Graham Telephone Co.

Sept. 15: Hearing on application of Choctaw Telephone Co., for increased rates at Soper, Okla.

Wisconsin Public Service Commission

Aug. 15: Hearing on application of Viking Telephone Co. for authority to increase rates.

V V

Organize Company to Serve North Carolina Area

A telephone company to serve the Peachland-Polkton areas in Anson County, North Carolina, and possibly some territory in Union County is being organized. Frank R. Ritchie and L. R. Upchurch, Jr., have applied for a franchise in the area for the Peachland-Polkton Telephone Co., which has a subscribed capital stock of $20,000.

The new company plans to erect a dial exchange midway between Peachland and Polkton. The territory is at present served by the Marshville exchange of the Central Carolina Telephone Co.

V V

A Knoxville, Tenn., police department switchboard operator said she has heard everything now. She answered a call, but no one spoke. The caller just played "Little Brown Jug" on a harmonica and hung up.

Honored at 65th Anniversary Of Founding of Bertrand, Neb.

Dr. William A. Schreck, who organized the Bertrand (Neb.) Telephone Co. and was its president for a number of years, was one of two doctors publicly honored at the recent celebration of the 65th anniversary of the founding of the town.

Dr. Schreck, who is 86 years of age, came to Bertrand in 1883 as a banker, was graduated from medical school and returned to enter practice. Babies he had brought into the world and still residing as adults in Bertrand formed a parade.

He was presented with a plaque inscribed with the appreciation of the community for services rendered. His son, Neil A. Schreck, now manager of the telephone company, was master of ceremonies.

V V

Ehinger Elected President Of Indiana Company

Charles Ehinger, general manager and secretary of the Citizen Telephone Co., Decatur, Ind., for several years, has been named president of the company.

He succeeds Leo Yager who was named president of the board of directors.

V V

Nebraska Company Announces Two New Appointments

The Nebraska Continental Telephone Co. has announced the appointments of M. J. Burr as district manager at Kearney and of John G. Richards as district manager at Alma.

Mr. Burr has occupied several executive positions with the company, his latest post being the Madison district embracing nine exchanges. He is succeeded by F. J. Wozny of Columbus, formerly a cableman.

Mr. Richards succeeds Joe L. Newman in charge of 10 of the company's southwestern Nebraska exchanges and two in Kansas. Mr. Richards has been wire chief at Columbus and has a long service record with Continental. Mr. Newman is retiring from active work at the end of the year.

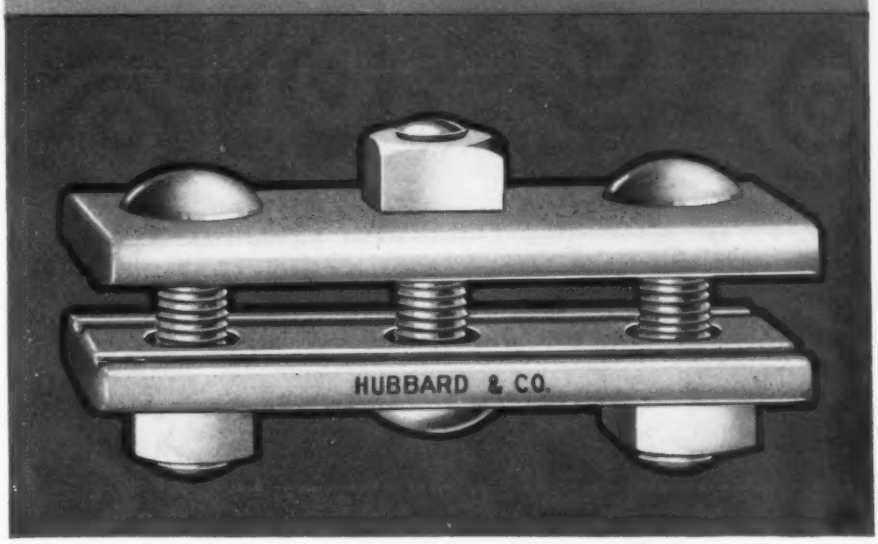
V V

BOOK REVIEW

(PRIMARY BATTERIES, by George Wood Vinal, Sc.D., physicist, National Bureau of Standards. 329 pages fully illustrated. Price $5.00. Available from TELEPHONY.)

Not since 1915 has one book so thoroughly covered primary batteries. This specialized treatment offers a wide range of information—history, theory,

HANG THE LOAD ON



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materials, chemical reactions, manufacture, and operating characteristics.

Much recent data are included which have been derived from the use of new research tools such as the electron microscope, x-ray spectrograph, mass spectrograph and the petrographic microscope. "These have been applied," says Mr. Vinal, "to study the crystal structures of the solid phases resulting from discharge and the gases liberated during periods of storage."

Covered for the first time in their modern forms in any book are several new types of special-purpose batteries. Included are batteries for operating at low temperatures, for giving large currents, for producing more energy per unit of weight, and those which remain inactive until required for use. Practical, detailed material is presented on silver oxide and chloride batteries, mercury oxide batteries, and perchloric and fluoboric acid batteries.

Of particular value to those dealing with precise electrical measurements is the thorough chapter on standard cells (standard of emf). Among other aspects it gives history, a general discussion, preparation, assembly, intercomparing emf's and temperature control.

Since 1918, the author has been Chief of the National Bureau of Standards' Division of Electrochemistry. For over 25 years he has had active charge of the primary standard of the volt in the United States.

A graduate of Wesleyan University, Mr. Vinal holds degrees of A.B. and A.M., and the honorary degree of D.Sc. (1936). He joined the National Bureau of Standards as a physicist in 1908, and is with the bureau at the present time.

In addition to his professional duties he has served on important committees of the American Standards Association, Federal Specifications Board, and NDRC. For the ASA he was chairman of the sectional committee on dry cells and batteries. With the Federal Specifications Board he was appointed chairman of the Technical Committee on Dry Cells and Storage Batteries in 1924; he is still working in that capacity. As secretary of the Joint Battery Advisory Committee (Army, Navy, NDRC) he served during 1944-45. Then, until 1949, he was chairman of that committee.

In addition to many professional papers on batteries, standard cells, and electrical units, Mr. Vinal is the author of the book *Storage Batteries*, now in its third edition.

V V

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V V

OBITUARIES

HARVEY A. NEHER, veteran representative of the Graybar Electric Co., died suddenly in St. Louis on July 31. He had had lunch and appeared in good spirits when he collapsed in a parking lot, dying almost immediately.

Mr. Neher had been with the Graybar company for 33 years.

He was a member of Theodore Gary Chapter of the Independent Telephone Pioneer Association.

He is survived by two daughters and a brother.

His wife had preceded him in death a year ago.

V V

Electric Hedge-Trimmer, Lawn-Edger Announced

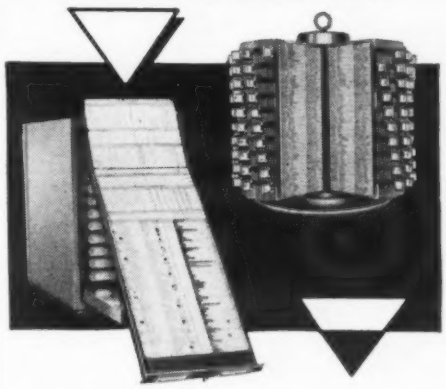
The Apex Manufacturing Laboratories, P. O. Box 283, South Pasadena, Calif., have announced production of their new Magic Wand, an electrical, all-purpose, combination lawn-edger, hedge-trimmer and weed and grass cutting tool.

According to the manufacturer, the Magic Wand is a light-weight gardening tool (home-type, three pounds; professional-type, five and one-half pounds) which can be handled easily by a child, but is capable of performing all delicate, as well as heavy, trimming and cutting operations about hedges, lawns, trees, flower beds and bushes, rocks, fences, curbing, bricking, posts, buildings, etc.—spots inaccessible to a lawn mower—with a minimum of effort on the part of the user.

The manufacturers claim that the use of the Magic Wand eliminates hours of laborious, back-breaking, unpleasant and fatiguing work, since in a matter of minutes, even seconds, the gardener can edge a lawn, trim a hedge, shape a bush, prune or thin trees or bushes, cut grass or weeds in hard-to-get-to places, under, over and behind bushes, trees, flowers, shrubbery, etc., thus accomplishing quickly and easily a job which formerly took a full day of tedious labor.

The Magic Wand operates on 110-ac or dc voltage, is built with a rotary, rather than an oscillating-type action, and employs a high carbon, tool-steel-tempered cutting blade. Oiling and greasing are unnecessary, and its simple though sturdy construction virtually eliminates maintenance and repair expenses.

SYSTEMS SALESMEN



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Write for personal interview, giving full details of your education, experience and qualifications. Please enclose a recent snapshot.

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Since the resistance of the relay is practically infinity below 60 volts, its normal breakdown voltage, the line remains normally free from paths to ground. Ringing voltage of 85 volts ionizes the rare inert gases, is transmitted without difficulty.

The Vincent Rare Gas Relay may be used on magneto or common battery lines. Over 100,000 in daily use! Write for details.

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WESTERN ELECTRIC COMPANY No. 1317, 5 bar, 1600 ohm, compact wall magneto telephone. Rebuilt transmitter and receiver. Service tested—in good condition—$12.00. TELEPHONE REPAIR & SUPPLY CO., 1760 Lunt Ave., Chicago 26, Ill.

ENTIRE STOCK IN MAGNETO EXCHANGE located in North East Kansas. 1949 gross after Bell commission $11,000. Selling price less than twice that amount. Write Box No. 2941, c/o TELEPHONY.

CONTROLLING INTEREST — all common battery exchange, Southwest Texas, grossing $46,000 after Bell commission deducted. Good condition. Contact: Box No. 2949, c/o TELEPHONY.

Other interest forces sale of well established contracting and engineering business serving a five state area. Will be sold at inventory price of truck fleet and work equipment; terms if desired. Very ideal for partners with knowledge of telephone construction and engineering most essential. Immediate possession possible. Write Box No. 2928, c/o TELEPHONY.

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